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ABSTRACT

Courses offered in 15 of the 16 member college districts of the League for Innovation in the Community College were surveyed in an effort to find "highly productive" courses; courses that reduce educational costs and maximize learning effectiveness. A comparison was made between highly productive conventional and nonconventional courses. The nonconventional courses were divided into three types of instructional modes: (1) large group, (2) individual programmed, and (3) audiotutorial. Findings and conclusions of this study include: (1) changing the pattern of classroom organization or the instructional mode can reduce per-pupil costs and increase learning effectiveness; (2) of the three nonconventional instructional modes, only the audiotutorial mode is more costly on a per-pupil basis than conventionally organized courses; (3) comparing the three nonconventional modes of instruction, courses under the large group approach are the least costly on a per-pupil basis, followed by the individualized programmed approach, and lastly, by the audiotutorial mode; and (4) subjective data indicate that courses taught under one of the nonconventional modes of instruction generally produce more effective instruction than their matching conventionally organized courses. Recommendations are also included. (RG)

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TOWARD INCREASED EFFICIENCY IN COMMUNITY JUNIOR COLLEGE COURSES

AN EXPLORATORY STUDY

by

Arthur Berchin

U.S. DEPARTMENT OF HEALTH,
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Foreword by

Ervin L. Harlacher

Introduction by

B. Lamar Johnson

Sponsored by

League for Innovation
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Los Angeles, Calif.

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I wish to express my gratitude to all League Colleges and their instructors who participated in this study. Their cooperation and wholehearted interest in my investigation made the process less a chore and more a pleasure.

I should mention particularly Brookdale Community College, whose Office of Developmental Research and Evaluation—especially Eleanor Roberts, its Assistant Director—contributed many suggestions for pursuing the study and devoted many hours to a critical reading of this report, offering editorial comments that have proved invaluable.

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Last, but by no means least, I am especially grateful to Harold S. Sloan, whose sincere interest in the study provided the author with both a wealth of knowledge and a source of inspiration, and who had enough confidence in me to allow me to conduct the study.

Arthur Berchin

Los Angeles, California
March 1972

FOREWORD

Nowhere in the world of the last decade have progress and change in higher education been more marked than in the American community college. Prompted by the growing conviction that merely to make education beyond the high school available is not enough, it has sought ways by which to make further learning also attractive. And, because there is no *one way* in which all people learn, much time, effort, creativity, and money have gone into developing new paths to learning. Among the colleges that have been most active in these endeavors are the members of the League for Innovation in the Community College. It is altogether appropriate, therefore, that the League should take steps designed to assess the costs and worth of some of these endeavors.

All education costs money; but, as former commissioner of education, James Allen, has observed, "the people have a right to be assured . . . that increasingly large investments in public education will produce results." Indeed, the "increasingly large investments" that many public two-year colleges have made in innovational design and practice have been specifically intended to "produce results"; that is, to bring a higher order of learning within the comprehension of greater numbers of students.

Unfortunately, the entire system of public education in America has grown up in a casual way. It has never been viewed or planned as a whole. Indeed, its development seems to have been determined by a combination of *vis inertiae,* the pressure of circumstance, and a struggle of individual levels for a place in the fiscal sun. As a consequence, community colleges that assume accountability for student learning are frequently faced with the double task of first preparing the student to learn and then inducing the learning he needs. How best to accomplish this task is a matter for continual study, and it can be costly. In considering costs, therefore, one must necessarily recall what President Nixon told the Congress and the nation in March 1970: "There is only one important question to be asked about education. What do the children learn?"

Ervin L. Harlacher
President
Brookdale Community College

Lincroft, New Jersey
March 30, 1972

INTRODUCTION

B. Lamar Johnson, Executive Director
League for Innovation in the Community College

The study reported in this monograph had its inception during conversations between Harold S. Sloan and me. Dr. Sloan is an economist, a former university professor, and a long-time student of higher education in the United States. He has a particular interest in the costs and efficiency of education, fields in which he has made a number of studies. In the fall of 1970 he told me that he was confident that the colleges and universities of America are offering a good number of notably efficient courses, keeping in focus both costs and outcomes. He further suggested that the identification, description, and reporting of such courses could perform an important service during the current financial crisis confronting the colleges and universities of our nation. The findings of such a study could be disseminated and the courses that were identified and reported could, with appropriate modifications, be replicated in other colleges and universities.

As we continued our visit, I suggested that it would be valuable to make a study to identify and report community college courses of the type to which Dr. Sloan referred. I also suggested that such a study might be made in colleges that comprise the membership of the League for Innovation in the Community College.

Following conferences and correspondence with members of the Board of Directors of the League for Innovation in the Community College, it was agreed that the League would sponsor an exploratory study, whose purpose would be to identify and report representative, highly efficient courses offered in member colleges.

The subject of the study is of great interest to the membership of the League for Innovation in the Community College, a national organization of 16 junior college districts, which aims, through cooperative work, to carry out and evaluate innovation and experimentation designed to improve various aspects of college operation. At the time of the study, the following 15 districts and 41 colleges comprised the membership of the League:

	No. of Colleges
BROOKDALE COMMUNITY COLLEGE, *Lincroft, New Jersey*	1
CENTRAL PIEDMONT COMMUNITY COLLEGE, *Charlotte, North Carolina*	1
COAST COMMUNITY COLLEGE DISTRICT, *Costa Mesa, California*	2
CUYAHOGA COMMUNITY COLLEGE, *Cleveland, Ohio*	3

	No. of Colleges
Dallas County Community College District, *Dallas, Texas*	3
Delta College, *University Center, Michigan*	1
Foothill Community College District, *Los Altos Hills, California*	2
Junior College District of St. Louis, *St. Louis, Missouri*	3
Kern Community College District, *Bakersfield, California*	3
Los Angeles Community College District, *Los Angeles, California*	8
Los Rios Community College District, *Sacramento, California*	3
Maricopa County Community College District, *Phoenix, Arizona*	5
Moraine Valley Community College, *Palos Hills, Illinois*	1
Peralta Community College District, *Oakland, California*	4
Santa Fe Junior College, *Gainesville, Florida*	1

Tulsa Junior College became a member of the League in January 1972, too late to participate in the study reported in this monograph.

In the late summer of 1971, an executive committee for the study was organized under the chairmanship of Ervin L. Harlacher, President, Brookdale Community College. Members of the committee are:

Ervin L. Harlacher, *President,* Brookdale Community College
B. Lamar Johnson, *Executive Director,* League for Innovation
Bill J. Priest, *Chancellor,* Dallas County Community College District
Norman E. Watson, *Chancellor,* Coast Community College District
Joseph W. Fordyce, *President,* Junior College District of St. Louis

The executive committee authorized the employment of Arthur Berchin to direct the study. Dr. Berchin obtained his doctorate from the University of California at Los Angeles. During 1969 and 1971, he participated in a U. S. Office of Education study on the costs of vocational education in high schools and community colleges throughout the country. He and Erick L. Lindman, professor of education at the University of California, Los Angeles, published the study under the title of "Financing Vocational Education in the Public Schools."

Berchin's report is primarily planned for the membership—administrators, boards of trustees, faculties—of the League for Innovation in the Community College. The League, however, is pleased to make this monograph available to other interested educators, particularly to those associated or concerned with community junior colleges, but also to those in other levels and units of American education.

It is hoped that the findings of Dr.Berchin's study will be of some help to readers in planning increasingly efficient instruction. The plans of instruction used in the courses he describes are a significant addition to the literature of college teaching.

It is also hoped that this pilot investigation will lead to more extensive and refined studies of efficiency in community college instruction, and that these in turn will point the way to increased efficiency in teaching and will aid in meeting the financial crisis confronting all of American education.

* * * * * *

The casual reader will want to read Chapter I, a summary chapter. It reports the general design and the major findings and recommendations of the study.

Chapter II and the appendices report in detail the method of research used in the study.

Chapters III, IV, and V will interest the student of teaching methods, for these chapters describe the plans and methods of teaching used in the many community college courses included in the study.

Many will read all the chapters and examine the appendices and thus understand the complete report and its significance.

CHAPTER I

INSTRUCTIONAL EFFICIENCY: AN OVERVIEW

In the August 2, 1971 issue of *The Chronicle of Higher Education*, one association leader is quoted as saying, "In times of tight budgets, you don't get innovation. You just do what you have to do to survive." While this may not typify the thinking of all college educators, it does reflect an attitude, pervasive enough throughout American colleges and universities, that discourages many administrators and instructors from participating more fully in experimentation and innovation in their course offerings.

The increasing costs at all levels of education have understandably bewildered and worried school administrators. Recently, these spiraling costs have occupied even more of the administrator's time as the financial problems of both the state and local governments have become more severe, and public agencies, competing for funds, have demanded more financial aid as local tax resources have dwindled.

In addition to the problems resulting from shrinking budgets, educators on all levels are facing demands from their state legislators as well as from their local communities that public schools and colleges be accountable for student learning. If educational institutions are going to require additional monies to subsist, echoes the public through its elected representatives, then both administrators and faculty will have to specify what can be done with these added funds. In their eagerness to obtain these new monies from their respective states, educators have declared—perhaps prematurely—that they can, indeed, meet this requirement, and are losing sight of the importance of incorporating into their objectives changes that may improve the effectiveness of education without increasing the costs.

As a consequence of the public's clamor for accountability from its schools and the schools' desire to receive more money, educators have jumped on the bandwagon of PPBS (planning, programming, budgeting systems) and are, one by one, attempting to alter their traditional function-item budgets to ascertain the costs and effectiveness of individual educational programs. By including objectives, stated in behavioral language, that specify both the minimum level of performance that their students will attain and the educational services needed to reach those objectives, administrators are hastening the creation of evaluative research in the form of cost-benefit studies—some of which are valuable tools for educators, and others of which, in their complexity and sophistication, are theoretical in nature and therefore limited in application.

All these activities may be worthy attempts to justify for educators as well as for the public the added costs of education, but they seem to overlook one important question: Does education always require additional monies or can changes be made within the limits of existing resources that will maintain or even lower the cost of education and, concurrently, maintain or even increase student learning?

THE PURPOSES OF THE STUDY

By surveying courses offered in community colleges of the League for Innovation in the Community College, the author hoped that examples of "highly productive" courses could be found; that is, courses that save their respective colleges some instructional costs and are at the same time effective in terms of their learning outcomes. By disseminating the results of the study, he further hoped that community colleges—and other units of American education—would be encouraged to replicate these "highly productive" courses or revise them to meet the needs of their students, keeping in mind the need to minimize educational costs and maximize learning effectiveness. Finally, by reporting these low-cost, high-learning courses, the League for Innovation hopes to make a notable contribution toward alleviating the financial crisis facing all of American education today.

THE DESIGN OF THE STUDY

The first step in the study was to ask presidents and deans of colleges in the League for Innovation in the Community College to identify courses offered in their colleges that in their judgment are highly productive. For comparison, administrators were also asked to name courses in the same or similar fields that are more conventional in terms of costs and learning outcomes. The conventional courses were assumed to be those in which students in groups of 40 or less met in a self-contained classroom and where the instructor used a lecture-discussion approach to communicate the course content.

Administrators' selections fell into three types of instructional mode. Because these three patterns differed substantially from the conventionally organized mode, they were termed "nonconventional" and each, in turn, was given a separate title for grouping together all the courses using that particular mode.

The first nonconventional mode used in many highly productive courses is termed the "large group mode of instruction." This mode basically allows an instructor to teach at one time at least two sections of a conventionally organized course. Frequently, if college facilities permit, several hundred students are enrolled in a course. Because he has at least doubled his enrollment, the instructor can no longer depend on a lecture-discussion approach to communicate the content of the course, but must use formal lectures to convey it. These large group sessions may be supplemented by smaller discussion sessions, held at various times during the week, so that students have a chance to ask questions. In some instances, instructors deliver their lectures through some medium such as radio or closed- or open-circuit television.

The second nonconventional plan used in various highly productive courses is the "individualized programmed mode of instruction." Instructors under this type of classroom organization assemble learning packages of printed material that are at least semi-programmed. Students are permitted to work at their individual pace of learning. Many times students do not meet on a regular basis in their classroom but may meet with the instructor either during an assigned conference period or when they have difficulty with any material in the learning package. Other courses use an instructional laboratory where students use audiotapes in conjunction with printed material—often in the form of a laboratory manual. Paraprofessionals frequently provide instructional assistance for the students.

The third nonconventional mode used in some highly productive courses is referred to as the "audiotutorial mode of instruction." This mode integrates several instructional approaches: the conventional, the large group, and the programmed classroom organization patterns. Perhaps the uniqueness of the audiotutorial approach is its extensive use of media and their accompanying software in the instructional laboratory. Within prescribed limits, students progress at their own learning pace and are able to receive instructional assistance from paraprofessionals.

A formula was devised to compute the per-pupil costs of the courses under both the conventional and nonconventional modes of instruction. To provide some evidence of instructional effectiveness, the grades and the number of students completing each course were collected. To supplement the objective data, subjective data were collected through 90-minute instructor interviews, held to assess the effectiveness of the courses under study.

POPULATION OF THE STUDY

The population for this study consists of 15 out of the 16 community college districts of the League for Innovation in the Community College.[1] Linking 42 colleges and more than 310,000 students, the League is a national consortium that functions specifically to stimulate innovation and experimentation.

The League is concerned with the following areas of junior college education: (1) experimenting in teaching, learning, guidance, and other aspects of college operation; (2) sharing results of experiments; (3) sharing conceptual planning and learning objectives; (4) exchanging instructional materials and procedures to enhance learning; (5) examining the relevance of various modes of college administration to experimentation in teaching and learning; (6) providing a common base for research on the effects of varied innovative practices by gathering and sharing data on students, programs, and modes of organization; and (7) evaluating the impact of an institution's practices on its students and community.

Supported by membership fees and additional contributions by member colleges, foundation grants, and other contracts, the League operates under the guidance of a board of directors, composed of the chief administrator of each member district. Each district also designates a representative to work with his respective board member in coordinating district activities.

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[1] Tulsa Community College District joined the League in January 1972, becoming the sixteenth member of the consortium. Because of the study's time limitations, however, it could not be included in the study.

LIMITATIONS OF THE STUDY

The following limitations are in large measure due to the fact that the study extended over only a six-month period:

1. The only courses included in the study are those administrators and instructors perceive as being highly productive. The short time available for the study did not permit the assembly and use of empirical data to select the courses to be studied.

2. It was possible to survey only a limited number of courses during the time available.

3. The purposes of the study limited courses surveyed to those perceived as being highly productive and should in no sense be judged as randomly selected courses.

4. Because each college represented has its own salary schedule for instructors and paraprofessionals, time precluded the use of a mean salary for all instructors and their assistants throughout the League colleges. Therefore, comparisons in costs between colleges within and among districts cannot be made with any degree of validity.

5. Data used in the study are largely limited to those available in the college at the time of the survey. It was, for example, impossible during the time available to initiate evaluative studies of courses under investigation. Information on outcomes is therefore largely restricted to data on course retention and grade distribution—importantly supplemented by the judgment of participating faculty members.

FINDINGS AND CONCLUSIONS

Because the following findings and conclusions are discussed in more detail in the chapters on the various modes of instruction, this section is intended only as a brief overview.

1. *Changing the pattern of classroom organization or the instructional mode can reduce per-pupil costs and increase learning effectiveness.*

Student enrollment is the major variable that increases or reduces per-pupil cost of education. Conventional courses are limited in the number of students that can be enrolled, thus tending to push costs upward. The three nonconventional modes of instruction identified in this study all have greater capacity for handling more students and are still able to provide effective instruction—in some cases even to increase the instructional effectiveness over that of courses taught conventionally.

2. *Courses organized under the large group mode of instruction generally are less costly on a per-pupil basis than conventionally organized courses.*

Per-pupil costs of courses using the large group approach are considerably lower than those using the conventional approach because of their ability to enroll far more students and still provide effective instruction. Also, since media are not extensively used in large group courses, the only added costs are the extra contact-hour credit given to instructors for teaching large groups and the stipend sometimes paid them for reorganizing the course in the large group mode.

3. *Courses organized under the individualized programmed mode of instruction are generally less costly on a per-pupil basis than conventionally organized courses.*

Courses under the individualized programmed mode, like those under the large group mode, handle many more students than those under the conventional classroom approach. Usually, these enrollments are high enough to compensate for the added cost of paraprofessionals who provide students with instructional assistance and for the extra cost of software such as printed matter, audio tapes, slides, and films. In addition to these costs, many instructors receive a stipend in the form of a lighter teaching load during the academic year or an extended summer contract for reorganizing the course under the programmed approach and for preparing the necessary instructional materials.

4. *Courses under the audiotutorial mode of instruction are generally more costly on a per-pupil basis than conventionally organized courses.*

Since the instructional laboratory often requires costly equipment, the added cost cannot be compensated for unless the student enrollment in audiotutorial courses is relatively high. Many audiotutorial courses have been organized for only a short period of time and, as a consequence, their enrollments are still far below the actual number that can be handled effectively. If the per-pupil costs are computed on each course's optimum level, many audiotutorial courses will have a lower per-pupil cost than their matching conventionally organized courses, since the latter have largely reached their optimum enrollments.

5. *Comparing the three nonconventional modes of instruction, courses under the large group approach are the least costly on a per-pupil basis, followed by those using the individualized programmed approach, and lastly, by courses under the audiotutorial mode.*

While all three instructional modes can handle far more students effectively than the conventional mode, the large group approach is the least costly of the three. The other two classroom approaches rely much more extensively on the use of media than the large group plan. In addition, they both require much more time for preparation of instructional material than does the large group plan. Therefore, instructors are usually given larger stipends to assemble such material. The audiotutorial plan is more costly than the other two, since it makes the most extensive use of sophisticated hardware and the accompanying software.

6. *Subjective data indicate that courses taught under one of the nonconventional modes of instruction generally produce more effective instruction than their matching conventionally organized courses.*

Most instructors who have taught their respective disciplines under both the conventional and the nonconventional mode indicate that they *perceive* the instruction as more effective under the nonconventional approach. Instructors using the individualized programmed and the audiotutorial approaches believe that these allow the instruction to be individualized according to the needs of their students, with students progressing at their own learning pace. Instructors using the large group approach say that the formal lectures and the use of team teaching compensate in some degree for the impersonalization that occurs in these courses. Many instructors further offset this disadvantage by offering small group sessions to provide more intimate contact between the students and themselves.

RECOMMENDATIONS

1. *Community colleges should offer courses using various modes of instruction systematically designed to attempt to reduce costs and provide more effective instruction.*

Since most community colleges within the League for Innovation offer courses under the several instructional plans, administrators and faculty should identify which should be taught only under the conventional plan, under both the conventional and a nonconventional plan, and only under one of the nonconventional plans. Besides reducing instructional costs, systematizing the instructional modes is essential, since community colleges, as open-door colleges, must meet the needs of divergent types of learners. Many students have been unsuccessful learners in public schools, where courses are, for the most part, taught in a conventional classroom. With a choice among the four modes of instruction at the community college level, these students may find another more suited to their individual needs.

2. *Subjective data indicate that courses using any of the three nonconventional modes should usually be reserved for self-directed learners.*

Counselors should describe to students the mode of instruction used in each course offered, so that they may enroll in courses whose mode will be most appropriate for them.

3. *Based on objective data, community colleges within the League for Innovation should conduct experimental studies—controlling for both student and instructor variables—to determine whether students enrolled in one course under the conventional instructional mode are more successful in prescribed learning outcomes than another group of students enrolled in the same course given in a nonconventional instructional mode.*

Whether the various approaches to instruction are an influencing variable in determining the success students have in their courses should be established. If instructional modes are correlated with students' success, there is further need to establish with objective data the kinds of learners that respond best to each of the instruction modes.

4. *Administrators and instructors within League community colleges need to work together to raise the student enrollments to optimum levels in each course given in a nonconventional mode of instruction.*

Effort should be made to enroll the most students that can be effectively handled in nonconventionally organized courses, since an advantage of offering them is that their enrollments can exceed those in conventional courses—and still attain effective instruction. Many audiotutorial courses will have a lower per-pupil cost when compared with the same courses offered under the conventional approach, but only if they have reached their optimum number of students.

5. *All possible effort should be made to develop and implement highly productive courses.*

Such courses require ingenuity, creativity—and a great deal of time. Stipends in the form of either a reduced teaching load or summer employment should be available for instructors who wish to reorganize their courses to achieve higher productivity.

CHAPTER II

THE PARAMETERS OF THE STUDY

To delineate the types of data collected in the League for Innovation's 15 community college districts, this chapter presents the variables used to determine the total cost of each course examined. The first section defines each variable and gives a rationale for its inclusion in the study. The next section presents a step-by-step explanation of the formula used to compute the per-pupil costs, and the last section discusses all the variables used to evaluate the instructional effectiveness of each pair of courses studied and the procedures followed in analyzing the effectiveness data.

COST VARIABLES

Because an underlying assumption of this report is that the indirect costs for both conventional and nonconventional courses are not significantly different, the report limits itself to direct instructional costs. Since variations in cost difference between courses under the conventional and the nonconventional modes result from changes in instructional procedures, they would be considered in college accounting systems as functions or variables to be charged against the major category of "Instructional Costs."

Instructors and Their Teaching Loads

The instructors who are chiefly responsible for teaching either the conventional or nonconventional courses included in this study all (except in some vocational courses) have at least a master's degree and a few a doctor's degree. Their teaching experience ranges from less than one year of college teaching to over fifteen years—some of which may have been at levels other than higher education. Because demographic data were not collected (the information is not essential to computing course costs), the average age of participating instructors has not been determined. However, the author's over-all impression was that most of the instructors involved in the unconventionally organized courses were over 40 and the rest under 35. In addition, most of the instructors had formerly taught under the conventional mode and, for different reasons, have reorganized their courses under an unconventional teaching plan. Some instructors, however, have participated in only the conventional or only the unconventional instructional mode.

In most League colleges, a full-time instructor is defined as one who teaches 15 hours per week, but there are exceptions. Some English instructors, for example, frequently carry only 12 hours of instruction and are still considered full-time; vocational and science instructors carry approximately 18 units of instructional credit for their full-time loads.

The cost for an instructor's time in any particular course is arrived at by comparing the number of his contact hours with his total teaching load for the semester. This percentage is then multiplied by the instructor's semester or quarterly salary to arrive at the cost for his time. For example, if an instructor's annual salary is $15,000, his salary for a semester is $7,500. He may receive 5 credit hours for teaching the course under study and, as a full-time instructor, be teaching 15 credit hours in total. Thus, he is spending 5/15 or 1/3 of his official teaching time on the course in question. Finally, one-third of his semester salary of $7,500 is then charged against this particular course—a total of $2,500.

Course Preparation

No attempt is made to charge against a course any cost for the instructor's time unless it becomes an actual cost for the college. For example, most instructors spend many hours in reorganizing their courses or in preparing instructional material for them, without being paid for it. Therefore, in computing the total costs of a course, this extra time, essential as it may be if students are to learn successfully, is not included. However, if the institution does pay the instructor for such activities, the costs are charged against the course. Furthermore, if the instructor receives released time to work on his new course, this too is treated as an additional cost of the course.

All of these labor costs to the college are amortized over a five-year period (ten semesters), since they are not considered ongoing as is, for example, an instructor's salary for performing his instructional duties. Five years seems a reasonable life for most software (printed materials, audio- and videotapes, filmstrips, slides), since, after five years, instructors will likely have to spend more time updating their courses and replacing obsolete software.

Cost of Paraprofessionals

In many of the courses under the nonconventional modes of instruction, instructors use paraprofessionals for various clerical duties (e.g., recording class attendance and examination grades) and for administering tests and other instructional materials. In courses using some type of instructional laboratory, many of the paraprofessionals are in charge of its operation, opening and closing the laboratory, caring for its equipment, and providing instructional assistance for those students requesting it.

All who spend time on the courses included in this study and who are paid for it are assumed to be a paraprofessional or instructional assistant. Their salaries or some portion of them are charged against the courses under study. In some cases, they are student tutors who are also community college students or are enrolled in a nearby senior college or university. In other cases, they hold advanced degrees and may be providing as much instruction for the students as the course instructor. Although conventionally organized courses occasionally have some type of paraprofessional providing a service for the instructor, it was thought (and later confirmed by this study) that courses under various unconventional modes of instruction use all types of paraprofessionals far more extensively than their conventional counterparts.

Since paraprofessionals are paid on either an hourly or a monthly basis, the total cost for their services is relatively simple to ascertain. It is added to the total direct cost of the courses studied. In addition, if any paraprofessional participates in the reorganization of the course and receives an extra stipend, this cost is also charged against the course.

If paraprofessionals are involved in several courses, however, only one of which is being studied in this report, the percentage of time devoted to the course under study is determined by comparing the number of hours spent in the one course under question with the hours spent in all their courses. This time is then calculated from their semester or quarterly salary. Many of these assistants are involved in Learning Resource Centers, helping to prepare software materials, or in media areas of the college, such as the television studio, and in courses structured under the large group teaching plan.

Equipment Costs

The cost of two types of equipment is charged against the courses in this study. The first is special-use equipment, defined as equipment purchased exclusively for the courses included in this study. In most cases, this equipment is used in audiotutorial instructional laboratories. Audio play-back units, various kinds of projectors, and the individual carrels installed in these laboratories are examples of equipment purchased exclusively for the courses. The total initial cost of this equipment is included as a part of the total direct cost of the courses that use them.

The second type of equipment charged against the courses studied is general-use equipment. (Although it may have been purchased for several different courses, this report will consider it only for the course or courses studied here.) Such equipment may include sophisticated projectors such as a sound-on-slide or computer time. The cost of conventional audiovisual equipment such as overhead projectors, slide projectors, and 16mm projectors is not, however, charged as a direct cost of the course because, just as library books are purchased as resources for the entire campus, so too is this standard equipment.

Determining the percentage to charge against the course under study for general-use equipment depends on student use, arrived at by comparing the number of students who use it with the number of students in all courses using it. This percentage is then multiplied by the initial cost of the equipment and added to the total direct cost of the courses in this report. For example, the course under study may use a number of microscopes totaling $10,000. Throughout the week, 300 students may use these microscopes, but only 100 or 1/3 of them are enrolled in the course under study. Therefore, only 1/3 of the initial cost of $10,000—or $3,333—can be charged against that course.

Costs for both special and general-use equipment are amortized over varying time periods, determined by administrators and instructors who provide a reasonable estimate of how long the equipment can probably last. In most cases, the equipment is judged to last five years (10 semesters); some inexpensive playback units are estimated to last no longer than two semesters: and such items as microscopes can last up to 20 years (40 semesters).

Miscellaneous Costs

The cost of software is included in the total direct costs of the courses of this report. Such costs as audio- and videotape, film for slides, filmstrips and movies, transparencies, simulation games, and other media materials are usually determined by the director of the college's Learning Resource or Media Center. These costs are also amortized over a five-year period (10 semesters).

Although conventional supplies such as paper, chalk, and equally common items are not included in the direct costs of the course, extraordinary supplies, such as those used by science laboratories, are charged against the courses being studied. Since these supplies are somewhat costly, and since courses designed for conventional and nonconventional modes of instruction use different amounts of them, their costs are considered.

Other such miscellaneous costs as field trips, equipment leasing, and equipment servicing are also considered as a direct instructional cost. In fact, any item judged to benefit the students is charged against the course as a direct cost of instruction.

THE FORMULA FOR COMPUTING THE COST OF AN INDIVIDUAL COURSE

To determine the per-pupil cost for a specified course, the following formula was developed. It takes into account the total number of variables being considered in the study:

$$\frac{(B/A \times C) + D + E/F + \dfrac{(G/H \times I) + J}{K} + L/M}{G}$$

The following steps demonstrate how the formula is applied to a single course. Although, for illustrative purposes, all the variables in the formula are used, in reality, not every variable in the formula applies to each course represented in this study.

Step One

To apportion a percentage of the instructor's salary for the course under study, the following variables are defined:

A = Per-Week Teaching Load

B = Hours Per Week Devoted to Course Named

C = Salary Applicable to Duration of Course

The following procedure is used for an instructor who spends 1/3 of his official teaching time in the course under study and whose total semester salary is \$5,000. Substituting the appropriate data in the formula (B/A x C), we have

(5/15 x \$5,000) = \$1,666.

Step Two

To determine the appropriate salary for paraprofessionals who provide services for the course under study, variable D is defined.

D = Amount Paid to Paraprofessionals for Duration of Course

If paraprofessionals are paid on an hourly rate, this rate is multiplied by the numbers of hours they spend on the course and this amount, in turn, is multiplied by the number of weeks in the semester. If they are paid on a monthly rate, the amount is multiplied by the number of months in the semester. For example, a paraprofessional may be paid \$3.20 per hour. He works for the course a total of 10 hours each week over a period of 18 weeks. The amount of his salary charged against the course is

(\$3.20) (10) (18) = \$576.

\$576 (the salary for the paraprofessional) is added to \$1,666 (the salary for the instructor).

Step Three

Since some colleges remunerate the instructor by stipend or by released time, this cost must be charged against the course and, therefore, variables E and F must be considered.

E = Stipend or Released Time Given to Instructor or Paraprofessional
F = Amortization Period of Five Years for Preparation of Course Materials

For example, if the same instructor under "Step One" is allowed to spend 3 hours of his teaching load (15 hours) preparing material for the course, then 5/15 or 1/3 of his semester salary ($5,000) must be charged off as an expense accrued by the course after it has been amortized. Thus, $1,666 amortized over 10 semesters (five years) is $167 per semester.

Step Four

Since many courses have general-use equipment, variables G, H, I, and K must be considered.

G = Total Number of Students Enrolled in the Course
H = Total Number of Students Using the Equipment
I = Initial Cost of Equipment
K = Varying Amortization Period for General- and Special-Use Equipment

If 500 students use the general-use equipment, which costs $15,000, and the course enrolls 100 students, the following computation is used to determine the appropriate amount to charge against the course:

100/500 x $15,000 = $3,000.

This amount then is amortized over a period of years suggested by League administrators and instructors. For example, if the $3,000 is amortized over 20 semesters (10 years), $150 is charged against the course.

Step Five

For courses requiring special-use equipment, variable J must be considered.

J = Initial Cost of Special-Use Equipment

For example, if the special-use equipment initially cost $20,000, this amount must be amortized over a varying time period, again provided by League administrators and instructors familiar with the equipment. If, in this case, the equipment is amortized over 14 semesters (7 years), $1,429 is charged to the course.

Step Six

For courses using special media, the cost of software materials must be included as an added cost of instruction.

L = Cost of Software Materials

Thus, if the cost of these materials is $850, this amount is amortized over 10 semesters (5 years), and $85 is charged to the course.

Step Seven

The last step is to substitute the enrollment data, variable G, in the formula.

G = Total Number of Students Enrolled in the Course

The cost per pupil can be derived by dividing the total direct instructional costs by the number of students enrolled in the course:

$$\frac{(B/A \times C) + D + D/F + \frac{(G/H \times I)}{K} + J + L/M}{G}$$

$$\frac{(5/15 \times \$5{,}000) + \$576 + \$1{,}666/10 + \frac{(100/500 \times \$15{,}000)}{20} + \frac{\$20{,}000}{14} + \$850/10}{100}$$

$$\frac{(1{,}666) + \$576 + \$167 + (\$3{,}000/20) = \$20{,}000/14 + \$850/10}{100}$$

$$\frac{\$1{,}666 + \$576 + \$167 + \$150 + \$1{,}429 + \$85}{100}$$

$$\frac{\$4{,}073}{100} = \$40.73 \text{ per pupil.}$$

EFFECTIVENESS VARIABLES

Evaluating courses in terms of their instructional effectiveness is difficult. At the outset of the study, much consideration had to be given to the learning outcomes of courses, so that the conventional mode could be compared with the nonconventional modes. It was decided that, within the time constraints of the study, the objective data most easily attainable are the percentage of students who successfully complete each pair of courses under their contrasting modes and the distribution of student grades under each mode. Because the study is not structured on an experimental research design, however, controlling for student variations such as socioeconomic differences, aptitude, or achievement is not possible. In addition, there is no control for variables regarding the instructors themselves and their styles of teaching. In short, because of the study's *ex post facto* design, no definitive approach can be used to ensure that differences in instructional effectiveness (as indicated by completion and grade distribution) result from the various instructional designs, and not merely from the interactions of the uncontrolled student and instructor variables.

Although, because of this, the objective data representing effectiveness in instruction may be subject to criticism, they are nevertheless presented in Chapters III, IV, and V, with the stipulation that they be interpreted only as possible indicators of success in instructional effectiveness. The students who successfully complete each course are those who attain the minimum of a passing grade. This number is then compared with the initial enrollment (the office enrollment as defined by each college's respective state) and a percentage of student completion is derived.

The distribution of grades given in each course is computed in the following way: By definition an "A" is assumed to be worth 4 points; a "B," 3 points; a "C," 2 points; and a "D," 1 point. These values are multiplied by the numbers of students in each course who earn each grade, and this sum is divided by the initial enrollment in the course. The resulting quotient represents the average grade earned by each student enrolled.

In addition to this information, subjective data have also been collected by interviewing every instructor who participated in the study. Such data are deemed most appropriate for a descriptive study of this nature. It is also felt that instructors who, in most cases, have taught their courses under both the conventional and the nonconventional modes, can provide valuable insight through their *perceptions* of how effective their courses are under the two plans of teaching. No attempt, however, is made to quantify the subjective data. Instead, they are used to assemble detailed descriptions of the procedures students follow in each course as well as the instructor's *perception* of how effective the course is under each of its modes.

The following questions were asked of each instructor who participated in the study. Not all questions, of course, apply to each course.

1. How much time was necessary (for instructors) to organize the course?

2. How much time must (instructors) devote to preparing and revising course materials?

3. Is released time necessary (for instructors) to revise course materials?

4. What types of revision need to be made in the course materials?

5. How much of (the instructor's) time per week is spent in contact with students?

6. Is (the instructor's) teaching schedule for the course flexible or relatively inflexible?

7. Does the course meet in any General Assembly Sessions? If so, what is the purpose of the GAS? Is it effective?

8. Does the course meet in any Small Assembly Sessions? If so, what is the purpose of the SAS? Is it effective?

9. Does the course use an instructional laboratory? If so, how would you evaluate its instructional effectiveness?

10. What types of media are used in the course?

11. What kind of instructional duties do the paraprofessionals or instructional associates perform?

12. Are students required to spend a specified amount of time in the instructional laboratory? If so, do any problems result from this time requirement?

13. Are students evaluated on the degree of their success or failure in meeting course objectives?

14. Do students feel that the method in which the course is taught is conducive to creating a warm, personal atmosphere?

15. Do several instructors help prepare the materials for the course? If so, does this division of labor help create improved course materials?

16. Are the teachers in the course subject to their colleagues' criticism? Does this help to bring about more effective instruction?

17. Should the approach to teaching this course be used for other courses in the district?

18. Should the approach to teaching this course be used for both majors and nonmajors?

CHAPTER III

THE LARGE GROUP MODE OF INSTRUCTION

Although universities have long been using the large group mode of instruction in their undergraduate classes—lecture halls or forums equipped to handle up to 400 students at one time—community colleges within the League for Innovation are only now beginning to experiment with this approach to classroom organization. In most cases, League colleges have not coerced their instructors to reorganize their conventional courses on the large group plan; in fact, most of the instructors involved have precipitated the change themselves. These instructors felt that, in the small self-contained classrooms characteristic of the conventional mode, they were spending undue time and energy in conveying to several small groups the same instructional material via the same lectures. They were therefore eager to test whether assembling all their students together and delivering one well-planned lecture might be more effective in learning outcomes than the conventional small-group approach.

Heavier Teaching Loads

In all League colleges, instructors participating in the large group plan receive additional classroom credit because of their responsibility for handling so many students. The rationale is that instructors now have to devote added time to organizing their material into formal lectures, whereas under the conventional approach, lectures to their small groups were informal—sometimes not even written down and kept for succeeding semesters.

The instructors in the large group mode indicate that they spend much time gathering material and writing out their formal lectures. In most cases, the instructors revise these lectures each semester the course is given, including new and relevant examples that illustrate more clearly the concepts being taught.

Distribution of Lectures

Most instructors in League colleges do not distribute their lectures to their classes, but they sometimes make them available through a course syllabus, which students may either purchase or, in some cases, receive without charge at the beginning of the semester. In one or two instances, instructors place their lectures on audiotape and store the series in the college's Learning Resource Center. Students are encouraged to listen to these tapes if they miss any lectures or if they merely need to have certain points clarified. Several instructors, who neither mimeograph nor record their lectures, write on chalkboard an outline showing the major points to be covered in a given lecture.

Formality of Assembly Halls

Instructors using this particular teaching mode differ somewhat on how formal the classroom environment should be. Some instructors discourage students from interrupting their lectures to ask questions, in which event they arrange small group sessions in addition to the large group meetings to answer students' questions or they do so individually. Other instructors, however, must encourage their students to ask questions during their lectures since classes meet only in large groups.

Attendance Requirements

Most of the League instructors require their students to attend the large group sessions. Roll is taken, usually by a paraprofessional. Since students are assigned seats in the assembly hall or forum, it takes only a few minutes to record those who are absent. Some instructors lock out students who come late to the general session. As soon as roll has been taken, the late arrivals are allowed to enter and are recorded as tardy. Those who arrive after this point are considered absent. In some cases, students are dropped from the course if they accumulate a specified number of absences or tardies.

The Use of Media

Media in courses under the large group mode are usually limited to conventional audiovisual hardware. Overhead projectors are frequently used instead of the chalkboard, since the latter is difficult to see in a large assembly hall. Moreover, the overhead projector allows the instructor to face his audience, whereas the chalkboard requires him to turn his back while writing.

In their large group meetings, instructors also project 16mm films and 2 x 2 slides—many of them taken on summer journeys to interesting and remote places of the world. While visual media are also used in courses under the conventional mode, in the teaching mode for large groups, the films and slides are frequently more elaborate, and their added cost can be better justified by the increased number of students who benefit from them.

Assembly Hall Capabilities

In the majority of League colleges, the large assembly halls have been designed so that the instructor, at the front of the room, can control the lighting throughout the hall. This permits him to focus attention on any activity he wishes. When he is lecturing, the house lights are dimmed, making him the center of the student's attention. On the other hand, if students are asking questions or participating in large group discussion, the house lights are brightened to establish the desirable atmosphere. In addition, some League colleges have constructed their assembly halls so that rear-view projection can be utilized. Prior to the general session, a film or filmstrip can be set up in the projection room (located in front of the assembly hall) either by the instructor himself or by an assistant from the media center. Then, at the appropriate place in his lecture, the instructor can begin the visual presentation by turning on only one control located next to his lectern. This not only saves time, but also gives the lecture a professional tone.

Small Group Sessions

Small group sessions are used by many instructors within the large group teaching approach so that students may question the instructor about any difficult material and discuss with each other some of the concepts introduced in the course. These small group sessions usually meet one hour per week, with attendance optional in some cases and mandatory in others. Some instructors also use these small sessions for testing, but others reserve the large group meetings for all student evaluation.

The Use of Paraprofessionals

While paraprofessionals under both the individualized programmed and audiotutorial modes sometimes perform diverse tasks, including instructional assistance, those under large group plan perform mostly clerical duties for the instructor or help evaluate students' papers. The clerical help is absolutely necessary because of the increased paper work occasioned by the large number of students enrolled in the course. Records of attendance and grades on quizzes and tests given throughout the semester must be kept.

In composition courses under this teaching mode, readers are needed to help instructors evaluate the many papers students write during the semester—in some cases following evaluation criteria established by the instructor. However, unlike practice under the other unconventional instructional modes, students who question any markings or other evaluative comments on their papers are directed to the course instructor and not to the paraprofessionals for clarification.

Team Teaching

Perhaps the most exciting feature of courses in League colleges designed for the large group mode is the use of team teaching. Whereas team teaching is used in conventional courses to provide students with individualized instruction, in courses taught in the large group modes it is intended to provide students with added substantive course material. Having two or more instructors—rather than one—provides students with a wider and more diverse exposure to the discipline. Moreover, since many more students are enrolled than in a conventional course, the added cost for the extra instructor can reasonably be justified.

Another reason many instructors have formal teams is that increased time is required to research material and assemble it into effective lectures. The team instructors usually schedule their lectures for alternate sessions; in most cases, this requires them to lecture no more than twice a week. Such a schedule gives them more than sufficient time to prepare their lectures.

In most cases, team teaching in League colleges does not require differentiated staffing. (Several examples of differentiated staffing are found, however, in League courses designed for the audiotutorial mode of instruction.) Each instructor is responsible for a specified number of lectures and therefore writes and delivers his own.

Each instructor usually attends all the large assembly meetings even when he is not delivering a lecture. Instructors report that this is an effective procedure because it ensures that each will know the content of his colleagues' lectures and will gain experience from the perspective of the students.

When instructors use team teaching in their large group instructional approach, they usually devote weekly sessions to discussing the lectures that have been given, including the effectiveness of the deliveries, or they criticize one another's lectures on an informal basis. Since instructors offer their colleagues constructive criticism, this practice becomes one of the major benefits of team teaching. Because instructors using the conventional approach usually do not receive student criticism or reaction until the end of the semester (in the form of course evaluation questionnaires), those who are part of a teaching team can provide mutual and valuable feedback on both lecture content and delivery.

In courses where the atmosphere is perhaps a little less formal, and where there are no small group sessions for student discussions, students and other team instructors alike are encouraged to interrupt the lecturer when they either have a question or disagree with some comment he has made. Instructors indicate, in fact, that students are startled at first when they witness one instructor reacting negatively to his lecturing colleague. Sometimes these exchanges become rather heated. However, the instructors believe that such intellectual contention helps make the large group plan an exciting and stimulating approach to teaching. They also feel that disagreements exemplify to students that learners, regardless of age, should continue to question all that they read or view through whatever media.

The Interdisciplinary Course

Because of the nature of the large group approach in conjunction with team teaching, several League colleges have assembled an interdisciplinary course in the humanities. A team of instructors, each an expert in such disciplines as literature, philosophy, music, or art, coordinate their lectures so that students in one or two semesters are introduced to several different disciplines. The large group mode is ideally suited for these interdisciplinary courses, since they whet the students' appetites for wider knowledge in a variety of subjects. Because the various disciplines are taught simultaneously, the students have a better chance to compare them and, perhaps, develop an interest in one in particular or even in several of them. In addition, and perhaps most importantly, students begin to realize that knowledge, though segmented into divisions or disciplines to facilitate in-depth study and investigation, should really be seen as united and indivisible, if man is to have a true picture of himself and his place in the universe.

The Large Group Plan Taught Through the Use of Media

While live lectures predominate in League courses under the large group approach, more and more instructors are experimenting with large groups and the use of media. Various courses throughout League colleges are broadcast through both closed-circuit television (where students can view the lecture in an assembly hall, in classrooms, and in libraries strategically located around the campus) and open-circuit television, for students and the general community who cannot come to the campus. One music course employs radio for communicating to large numbers of students.

Several colleges that use these media to teach high enrollment classes broadcast tapes (audio and visual) several times throughout the day. This frequent scheduling of the taped lectures provides flexibility for the students, especially those who spend daytime hours on a job. A few of these courses even store some of the audio portions of their videotapes in the college's Learning Resource Center for students who either have missed the scheduled broadcast or merely wish to hear the lectures again.

One advantage of the media lecture over the live lecture is its visual potential. Instructors are learning that, while lectures given in a live setting depend largely on language to communicate the instructional material, lectures on television can use the picture to supplement the language. Making this adjustment can be difficult, especially for instructors who have spent long hours designing lectures for students in assembly halls, but plans in several League colleges for future on-location shooting of many of the instructional tapes and films show that instructors are successfully making the transition from the live to the media lecture.

Several instructors have added small group sessions to their media lectures so that students can discuss the instructional material in the taped lectures as well as have some direct contact with the instructor. Experience has taught that students need some exposure to the instructor in person if they are to maintain an interest in the course. Too many students feel that courses taught totally through the media are impersonal and, eventually losing interest, they stop attending the scheduled broadcasts.

The Variable of the Instructor

Not all instructors are suited for the large group mode in either the live sessions or the taped ones. Those who participate in this teaching plan must enjoy working with large groups of people, taking on a performing role rather than the teaching role characteristic of the conventional mode. Large group teaching does not permit communication on a one-to-one basis, as in courses under the audiotutorial and individualized programmed modes. Instructors' lectures as well as their deliveries must be capable of reaching students throughout the assembly hall—especially those in the rear seats. They must be individuals who enjoy communicating to many students and feel comfortable standing in front of a mass audience. Several League instructors confide that, like an actor waiting for a performance to begin, they feel somewhat nervous before delivering a lecture. Those who might not enjoy these minutes of anxiety probably will not enjoy teaching courses in the large group mode.

THE COST OF LARGE GROUP COURSES

Courses using the large group mode tend to have a lower per-pupil cost than their matching conventional courses (see Table III-1). The large group courses range in their direct instructional cost from a low of $6.11 per pupil to a high of $75.00. The mean direct instruction cost per pupil is $31.28. In contrast, the courses using a conventional mode of instruction have a range of direct instructional cost from a low of $20.53 per pupil to a high of $68.80. The mean direct instructional cost for conventionally organized courses is $40.68 per pupil.

Despite the added costs of courses taught in the large group mode resulting from extra contact-hour credit for instructors, special stipends paid them for reorganizing the courses, and some extra expense for audiovidual equipment, the per-pupil cost is generally lower than for the conventional courses. The variable that influences these lower per-pupil costs is, of course, the considerably higher class enrollment in the large group. Even in those courses with expensive broadcasting equipment, student enrollments are high enough to offset the added costs, making the cost per pupil still lower than under the conventional plan (see Appendix A).

THE EFFECTIVENESS OF LARGE GROUP COURSES

Considering the number of students successfully completing the course and the grade distribution for each, no consistent pattern develops to show whether courses under either the large group or conventional modes of instruction are more effective (see Table III-2). The results, as indicated in the table, are probably due more to the aptitude of the student entering the course than to the effect of its organization and instructional mode on him. Therefore, from the objective data alone, one can draw no conclusions about which instructional plan is more effective in learning outcomes.

Despite this fact, however, subjective data collected through instructor interviews establish that large group instruction is at least as effective as the conventional mode. Moreover, the large group mode provides students with benefits not available under the conventional approach. The following examples present some of these advantages, as seen by large-group instructors, and illustrate various procedures that students follow in these courses.

TABLE III-1

A COMPARISON OF DIRECT INSTRUCTIONAL COSTS BETWEEN COURSES UNDER THE LARGE GROUP AND THE CONVENTIONAL MODES OF INSTRUCTION

Name of Course	District Where Course Is Given	Large Group Cost per Pupil	Conventional Cost per Pupil
Algebra (Elementary)	Junior College District of St. Louis	$48.81	$40.23
Algebra (Intermediate)	Junior College District of St. Louis	26.25	34.42
Anthropology II	Coast Community College District	30.41	46.64
Biology 101	Cuyahoga Community College	24.98	68.80
Data Processing 101	Cuyahoga Community College	21.29	26.42
English 50	Kern Community College District	22.43	49.56
English II	Junior College District of St. Louis	75.00	51.46
Economics 111	Delta Community College	57.44	54.89
History 111	Maricopa County Community College District	30.35	36.39
Home Economics 141	Maricopa County Community College District	8.75	25.52
Humanities 101-Philosophy 101	Cuyahoga Community College	30.34	20.53
Music 141	Maricopa County Community College District	6.11	31.26
Psychology 100	Coast Community College District	37.47	N.A.*
Social Science 103	Cuyahoga Community College	18.24	28.77
Sociology 211	Delta Community College	44.20	58.89
Sociology 101	Maricopa County Community College District	24.59	36.59

*As used here and throughout this report N.A. signifies "not available."

TABLE III-2

A COMPARISON OF LEARNING OUTCOMES BETWEEN COURSES UNDER THE LARGE GROUP AND THE CONVENTIONAL MODES OF INSTRUCTION

Name of Course	District Where Course Is Given	Large Group		Conventional	
		Percentage of Students Completing the Course	Student Grades Weighted Index)	Percentage of Students Completing the Course	Student Grades (Weighted Index)
Algebra (Elementary)	Junior College District of St. Louis	58.44	1.31	62.86	1.40
Algebra (Intermediate)	Junior College District of St. Louis	50.85	1.00	31.11	.89
Anthropology II	Coast Community College District	73.58	1.94	78.34	1.97
Biology 101	Cuyahoga Community College	91.95	2.21	59.01	1.50
Data Processing 101	Cuyahoga Community College	79.20	1.82	85.37	1.87
English 50	Kern Community College District	73.90	1.83	66.28	1.56
English II	Junior College District of St. Louis	97.06	2.85	69.23	2.12
Economics 111	Delta Community College	91.45	1.91	94.66	1.68
History 111	Maricopa County Community College District	75.44	1.81	69.57	1.43
Humanities 101-Philosophy 101	Cuyahoga Community College	55.06	1.40	72.09	1.74
Music 141	Maricopa County Community College District	84.37	2.69	73.82	2.46
Social Science 103	Cuyahoga Community College	83.08	2.21	97.50	2.75
Sociology 211	Delta Community College	87.41	1.85	81.65	2.18
Sociology 101	Maricopa County Community College District	88.33	1.90	75.23	1.86
Home Economics 141	Maricopa County Community College District	76.32	2.45	91.84	2.74
Psychology 100	Coast Community College District	72.56	1.66	N.A.	N.A.

ALGEBRA (ELEMENTARY): FALL 1971
Florissant Valley College
(Junior College District of St. Louis)

Elementary Algebra employs team teaching along with the large group instructional mode to teach freshmen introductory algebra. This same course in the spring of 1968 used a self-contained classroom in which an instructor met a relatively small group of students for three hours per week; under the team approach, two instructors meet approximately 80 students for the same period of time.

Though most of the large group sessions are devoted to lectures by one instructor, periodically the students are divided into two smaller sections so that they may ask questions about the material in the lectures. According to one instructor, the lectures are effective enough for presenting the objectives but are not as effective in answering individual student questions. Both team members nevertheless have confidence that the large group is probably as good as the self-contained classroom for instructing students in the fundamentals of algebra.

While the conventional mode used a standard algebra textbook, the large group mode used a textbook newly written by four instructors in Florissant Valley College (two of them members of the teaching team). The book is structured on a systems approach so that the student is presented with an objective—behaviorally stated—followed by activities (sets of problems) and some type of evaluation. The instructor stressed the importance of this new material in bringing about improved instruction in the course.

The overhead projector is used extensively in the large group approach, since, as pointed out earlier, the chalkboard is relatively ineffective. The instructor, usually, creates his own hand-written transparencies. At the conclusion of each general assembly session, a short quiz is given to the students to see if the objective has successfully been achieved. These quizzes are also used as evidence of student attendance during the session.

The instructor enthusiastically recommends the use of team teaching in other subjects and other disciplines. He stresses the benefits that accrue from having several instructors write, as well as teach, the course material. "We serve as checks for one another," he said. The instructor could perceive no difference in effectiveness between majors and nonmajors.

ALGEBRA (INTERMEDIATE): SPRING 1969
Forest Park College
(Junior College District of St. Louis)

Intermediate Algebra is a one-semester course for freshmen who have completed one year of high school algebra. It uses a large group approach in combination with small assembly sessions as its mode of instruction.

Under the conventional mode, students met for three one-hour lectures—discussion sessions in a self-contained classroom. In contrast, under the large group mode, the course consists of two one-hour general assembly sessions—essentially two conventional sections combined. These sessions are devoted to the instructor's lectures, and students are discouraged from asking questions. An overhead projector is generally used instead of the traditional chalkboard.

Besides the general assembly session, the large group instructional mode uses two one-hour small assembly sessions, which require the instructor's presence for an additional two hours each week. At these small discussion groups, students are encouraged to ask questions about the material previously presented in the lectures. The instructor provides help both for the group as a whole and for individual students. As the instructor stated, "The general assembly sessions are my discussion with them, and the small assembly sessions are the students' discussion with me."

The instructor feels that beginning students in college mathematics benefit from the combined large and small group approach. She said further that students working in a larger group seem, for some unidentified reason, to assume more responsibility and to become more competitive with their peers.

When asked whether she would recommend the combination large-small group approach to other areas of mathematics, the instructor said yes, commenting that this instructional mode helps to "sell" students on mathematics. She also feels that both majors and nonmajors in mathematics can profit from this mode of instruction.

ANTHROPOLOGY II: SPRING 1971

Orange Coast College
(Coast Community College District)

Anthropology II at Orange Coast College, using the large group mode, is a cultural anthropology course designed for sophomores. Its major objective is to study the total social structure of preliterate people to understand the numerous cultural influences on the individual. During the course, the students are introduced to an analysis of social structure, family, kinship, belief, and rite.

They meet each week for two hours in a large group session and one hour a week in a seminar session. During the large group meetings, students are exposed to several different media: motion picture films, audio- and videotapes, and sets of 2 x 2 slides.

The conventionally organized course (no longer offered at Orange Coast College) required that students meet for three hours per week in self-contained classrooms. They were exposed to both motion picture films and sets of 2 x 2 slides.

The instructor has taught the course both ways. He indicated that reorganizing the course on the large group plan required much time. (In fact, it required much of the preceding summer to prepare for the opening of the course in the fall.) On the other hand, it took little time to organize the traditional course, for much of the material came from the instructor's university course work.

The instructor spends approximately five hours a week revising course material. Since he delivers only one two-hour lecture each week, he devotes a great amount of time to making it as effective as possible. In the conventional course, however, he made his revisions as he progressed through each of the many sections he taught.

One advantage of the large group approach, he believes, is that the same lectures do not have to be repeated during the week as they were for each of the separate sections under the conventional mode of instruction. As a result, the instructor does not himself become bored and frustrated by repeatedly lecturing on the same material to small groups of students. Another advantage is that the seminar sessions are devoted entirely to discussions of issues and ideas introduced in the large group assembly meeting. Most of the weekly three-hour small group sessions under the conventional mode were devoted to lectures by the instructor, leaving little time for students to express their opinions and reactions.

Although the instructor has enjoyed teaching under the large group system more than under the conventional, he is trying to revise the presentation to include a series of 42 films made by the district on the various topics covered in the course. If he succeeds in having the film project funded, the lectures under the large group mode will be replaced by well-written and well-directed films, many of them actually shot on location.

Biology 101: Fall 1970

Cuyahoga Community College

Biology 101 is an eleven-week introductory course in principles of biology for nonmajor students. It uses the large group instructional mode, with students meeting two hours per week in a large lecture hall and three hours per week in a laboratory setting.

The large assembly sessions are devoted to instructional material that is meant to be motivating in nature, in that the instructor attempts to relate it to matters in the community. In addition, these motivating lectures are placed on audiotapes and kept in the learning center for students to use at their convenience. Under the conventional instructional mode, the two hours per week students spent in a lecture hall were devoted to the traditional lectures, which were not placed on audiotapes.

In the laboratory, students work through the various stations in small groups of approximately four each. Those who are unable to complete the prescribed work in the allotted three hours can finish it at their own convenience in the open laboratory. Laboratory assistants provide the appropriate materials. Under the conventional mode, in contrast, students were required to complete the laboratory assignment in the allotted three hours.

Testing, which was traditional under the conventional mode, is done on an informal, individualized basis in the large group mode. The instructor prepares two types of examinations: one is classified as the "C" examination, and the other as the "A-B" examination. Students who feel they have done only minimum preparation in a particular unit ask the instructor for the "C" test. To pass the test, they must score at the 75 percent level of success. If they achieve this level, they can then take the "A-B" test to see if they can score at the 80 percent level for a grade of "B" or at the 90 percent level for a grade of "A." However, students not successful at the 75 percent level are directed back for additional study and then, when ready, are given an alternate form of the test. If still not successful, and after a conference with the instructor, they can retake the test. If they do not succeed the third time, they are given an incomplete mark. To receive a passing grade in the course, they have six weeks in which to retake any examinations that resulted in an incomplete mark.

The instructor stated that this testing procedure helps to restore students' confidence. Under the conventional mode, students were all required to take the course examinations, whether or not they were prepared. Under the large group mode, testing is used only to measure whether or not students have attained the course's behavioral objectives. The traditional testing procedure, in effect, punished students who were having difficulty in understanding the material.

The instructor recommended that his procedures in the large group instructional mode be used in other disciplines, for he feels that both majors and nonmajors can benefit from them.

DATA PROCESSING 101: SPRING 1971

Cuyahoga Community College

Data Processing 101 uses the large group mode to introduce students to computer work. The major difference between this course and the one taught under the conventional mode was the number of students in a section. In the spring quarter, two instructors each had one section of about 70 students. Under the conventional mode, the course was limited to about 40 students per section.

The course under both modes meets for four hours per week. While the instructor in the conventional mode uses informal lectures combined with discussion, in the large group approach, the instructor follows carefully prepared outlines in his lectures. One outline is prepared for each of the meetings during the ten-week period. These outlines are not given to the students but are shared with the instructor of the other section. In turn, the other instructor helps to prepare several of the short quizzes that are placed on transparencies and projected at the beginning of each class period. Both instructors use the quizzes as attendance records.

The instructor uses the overhead projector extensively in the large group mode. He enjoys facing the students while at the projector rather than having to turn his back to write on the chalkboard as in the conventional mode. He also uses several films in the large group approach because he can take many more students into the unit record and computer rooms than is possible under conventional instruction. When asked whether he would recommend the large group approach for other subjects and other disciplines, he said that introductory or survey courses are best suited for this instructional mode.

ENGLISH 50: FALL 1970

Bakersfield College
(Kern Community College District)

English 50 is a remedial course in written composition for students who need to develop basic writing skills before enrolling in the college credit 1A English course. The course is taught under two different instructional modes: the small group or conventional concept, which limits each section to a maximum of 30 students, and the large group concept, which enrolls nearly 400 students in four different sections.

The course, as taught under both modes, requires students to meet each week for three one-hour sessions. The instructor teaches sections of English 50 under both instructional modes, using the same pedagogical techniques. The first four-hour sessions are devoted to teaching sentence concepts, syntax, usage, diction, and punctuation. The fifth session is a discussion of composition content and appropriate organization, while the sixth session is reserved for a writing period. This cycle is repeated throughout the semester.

Readers are used under both modes of instruction, although their number is far greater under the large group mode. These readers are sophomores who have completed several English courses with a high degree of success. They are instructed by the full-time teacher in the procedures to be followed in grading compositions. To standardize the system of grading, the readers use a scoring card that indicates the types of errors for which they can hold students accountable. Students who disagree with any of the readers' markings may discuss their compositions with the full-time instructor.

The instructor *encourages* those with specific writing problems to use the autotutor, which is stored in the audiovisual laboratory. (The autotutor uses 35mm film to present a branching program in various composition concepts.) At no time does the instructor *require* them to spend time with the autotutor programs.

Students who have written four compositions, consistently earning a minimum grade of "C," have the option of receiving credit for the course before the end of the semester if they are able to complete several specified programs on the autotutor, but many in this situation elect to continue in the course to improve their writing skills and possibly earn a higher grade.

The instructor specified that he has no real preference between the large and the small group instructional mode. He believes, however, that some students prefer to learn among large numbers of their peers, while others prefer learning in small classrooms. Therefore, colleges should offer both instructional modes to meet the needs of different learners. He also stated that, after having collected data on student grades in English 1A (the next required course), he finds no consistent pattern of proficiency among students who have completed the English 50 course under either instructional mode.

ENGLISH II: FALL 1971

Florissant Valley College
(Junior College District of St. Louis)

English II is a semester course for freshmen in English composition. It uses team teaching in conjunction with the large group approach. Students meet for three hours a week in both general and small assembly sessions.

Three instructors as a team use their respective areas of expertise in the theatre, the cinema, and literature to broaden the fairly traditional composition course, which is limited to the teaching of expository prose. Under the team approach, students are introduced to the knowledge and skills needed to compose for both the visual and the literary arts.

The first weeks of the semester, students are exposed to famous examples of the various media. "Citizen Kane" represents the cinema; *Portrait of the Artist as a Young Man* represents the literary art; and several short plays are acted out by the drama department to introduce students to the theatre. These one-hour meetings are large assembly sessions, but the students see such exemplary items as full-length films outside of class on a scheduled basis. The sessions themselves are devoted to discussion and reaction by the three instructors to each other's point of view on the various works of art. One instructor stated that an advantage of these lecture sessions is the sometimes heated discussions among the three instructors. Students are encouraged to participate in these discussions by asking any or all of the team members pertinent questions.

Later in the semester, students are provided with minipackets that have been prepared by the instructors during the preceding summer. These packets, checked out to students in the English Instruction Laboratory, cover the three types of media and consist of articles and discussion questions on each medium. Comment was made parenthetically that an advantage of team teaching lies in the division of labor when assembling these packets: each instructor helps to search out the diverse instructional materials the packets contain.

After students have an opportunity to study the materials, they meet in six groups of ten, each group discussing one of the media. The instructors walk around from group to group listening to their discussions. Students then are given evaluation forms and told to evaluate each member's participation in the group discussion. These evaluations are quantified, and the scores are kept in the English Instructional Laboratory for students who want to know how their peers have evaluated them.

The final weeks of the semester are devoted to small group or individual projects pertaining to one of the course's three media. These activities range from writing short plays to shooting short films, and become the major source for student evaluation. The instructors use the peer evaluations for students on the borderline between two grades.

While the fall semester had only about 60 students, the instructor who was interviewed felt that the course could handle a great many more. In his opinion, more English classes should use team teaching to create interdisciplinary courses. Although the three instructors plan to make several course revisions (such as requiring students to engage in more writing activities, and screening them on their writing ability at the beginning of the semester), they believe they have created a course that is both instructionally effective and intellectually stimulating.

ECONOMICS 111: WINTER 1971

Delta Community College

Economics 111 is a one-semester course that combines the use of closed-circuit television with small assembly sessions. It had been taught in the conventional mode, with students meeting in relatively small groups to listen to lectures three hours a week in a self-contained classroom. The rationale for the televised approach is that in a conventional mode, requiring a 15-hour teaching load, at least 15 hours are spent in presenting materials. When the teaching load is made up of several sections of one course, the teacher has 15 hours of presentation, most of it repetitious. Every hour lost to repeating is lost to the other important areas of educational engineering. Taking the repetition, boredom, and mechanics out of the teacher's load is one way that TV can be used effectively.

Each week students in Economics 111 view two 30-minute lectures and spend one additional hour in small assembly sessions limited to 25 students. Because he does not have to repeat his lectures, the instructor is able to help more students individually throughout the semester.

When the course first began, many students reacted to it negatively, but, when they began to realize that the seminar sessions were scheduled at very convenient times during the week, they changed their opinions about the organizational structure. They also appreciated that the lectures on tapes were televised five times a week.

When asked if he would recommend that other courses use closed-circuit television in combination with small assembly sessions, the instructor said he believed this instructional mode is best suited for subjects that convey their instructional material through lectures and for subjects that need demonstrations.

Even though most of the research indicates that TV teaching, as compared with other methods, does not produce significantly better results, the instructor is satisfied with the approach. After all, TV courses free the teacher from much of the repetition and mechanics of traditional teaching; they provide time for more private interaction with the students and for more flexible student scheduling.

HISTORY 111: FALL 1971

Glendale College
(Maricopa County Community College District)

History 111 uses the large group instructional mode in combination with individual learning in the language laboratory. The one-semester course is a survey of mankind's development from the beginning of the Graeco-Roman civilization to the Renaissance. Most students who enroll in the course are freshmen.

Students spend three class hours per week in large group lectures where factual exposition and interpretation are combined. In addition, students attend, on their own time, the language laboratory in the Audio Visual Center where they listen to fifteen 30-minute audiotapes of lectures accompanying the course. They are also furnished a word list to accompany each tape. If they wish, they may furnish their own cassettes and have the audiotape quickly recorded for use at home on their own recorders. Thirty recorders are available from the Audio Visual Center for overnight check-out.

History 111, as taught conventionally, uses small, self-contained groups of about 40 students meeting three hours per week, to teach the same course content as in the large group instructional mode. However, students here receive only printed copies of the materials that are presented by audio-tapes under the large lecture approach.

Because more preparation is required of the instructor for teaching large groups of students, released time is provided in the form of a reduced teaching load. The instructor of the conventionally organized course does not feel that released time is warranted in his case.

The instructor in the large assembly approach reports that the first examination shows that the test items, based on the audiotapes, are not successfully answered by students. While the instructor is disappointed by these results, the course has not been operating long enough for him to reach any definite conclusion on the effectiveness of the audiotapes.

Each instructor is satisfied with the mode of instruction he is using. They both feel that the two instructional modes are equally effective for both majors and nonmajors in history. While the instructor in the large assembly mode feels this approach can be helpful in many instructional disciplines, the instructor in the conventional approach feels he has adapted himself and his material to the teaching of small groups.

HOME ECONOMICS 141: SPRING 1971

Phoenix College
(Maricopa County Community College District)

Home Economics 141 uses open-circuit television for its instructional mode. The one-semester course is broadcast at 8:30 A.M., twice a week, for 30-minute periods. Under the conventional approach, students met two hours per week in a self-contained classroom.

While the State of Arizona considers the course vocational in nature, students enroll in it out of personal interest. It has four major purposes: (1) to present an opportunity to learn principles and practices of nutrition; (2) to illustrate some of the cultural, social, and environmental meanings of food; (3) to teach different diets for different ages; and (4) to point out dietary differences for physical variances, diseases, and individuals.

The instructor said that no additional time was required to organize the course as taught via open-circuit television, but that more time was needed to prepare and revise instructional materials for the television course than for the self-contained course.

The television approach uses many more visuals than the conventional approach. The instructor, of course, has to spend long hours locating these visuals to illustrate the concepts being taught. Films cannot be used as extensively in the television course as desired, since clearance for many films is hard to obtain.

When asked which instructional mode she would recommend for other disciplines, the instructor noted the advantages of both approaches. "The majors in a subject should use the classroom approach while the television approach is more appropriate for nonmajors. Majors should be able to ask questions directly of the instructor."

HUMANITIES 101 - PHILOSOPHY 101: FALL 1970

Cuyahoga Community College

Introduction to Humanities 101 combines a large group instructional mode with a team teaching approach, each instructor being responsible for preparing lectures in his specialty.

The Humanities course is the first of a three-quarter sequence. The first quarter deals with man as an individual; the second, with man and society; the third, with man's relation to the cosmos. During the ten-week period students are introduced to man's artistic, literary, and philosophical works. Specifically, the general objectives of the course are: (1) to give the students a deeper knowledge and appreciation of man's art, music, literature, and philosophy; (2) to develop an analytic and critical ability in the student; (3) to stimulate the student's creativity; and (4) to show that the humanities can have a significant effect on the student's personal development.

The class meets twice a week—for one 100-minute session and one 50-minute session. The course is so designed that the class can meet in a large assembly session with all three of the instructors present or in small assembly sessions with each instructor meeting his assigned group. The choice of a large or small group is determined by the subject matter and does not follow a fixed pattern. In the 1970 fall quarter, 15 sessions were large group and five were small.

The instructors said that the small assembly sessions are superfluous, since the students can discuss the selected topics among themselves and with the core instructors in the general assembly sessions. They stated emphatically that the general assembly sessions are effective despite the large number of students. The success of these sessions is perceived as a result of the sometimes heated interchange among the instructors while the lectures are in process. Whenever one of the other instructors disagrees with a statement made by the lecturer, he interrupts him and challenges him on a specific point. This intellectual enthusiasm is transmitted to the students and, as a consequence, makes the general assembly sessions exciting and stimulating learning experiences.

An unexpected benefit of the Humanities course is the in-service education that each instructor provides for his colleagues. In preparing a specified number of lectures, each instructor rereads some work to reacquaint himself with the author's ideas. As a consequence, the fresh perspective of his lectures has encouraged his counterparts to reread those works discussed in the lectures. One lecture was so intriguing that it inspired one of the instructors to read the work under study five times.

Philosophy 101 is organized on a conventional mode of instruction. Groups of approximately 40 students meet in a self-contained classroom four hours per week. The 50-minute period is usually divided into 30 minutes of lecture followed by 20 minutes of directed discussion, during which specific questions are asked. These discussion questions aim to encourage the student to relate the new instructional material to his previous learning in the course, to his knowledge gained in other courses, and to his own experience.

The general objectives of the philosophy course are: (1) to develop in the student the ability to approach a problem as the philosopher does; and (2) to acquaint the student with the ideas of the major thinkers and to see philosophy as both a body of ideas and an activity.

The instructors believe that their approach to teaching the humanities is effective, despite the fact that their attrition rate is higher than for the average academic course at the college. They feel that the students who remain in the course for its duration benefit greatly from the team approach. At present, they do not intend to introduce any type of instructional laboratory to help individualize instruction. They are content with teaching the interdisciplinary course to large groups of students.

When asked whether majors or nonmajors in the humanities would benefit most from the large lecture instructional mode combined with team teaching, one instructor stressed that all young people benefit from it, because it allows the instructors to demonstrate, through their continual interchange, that man's great works of art must inspire questioning—challenging the creator's ideas if necessary— if we are to develop in ourselves an intellectual life.

MUSIC 141: SPRING 1971

Phoenix College
(Maricopa County Community College District)

Music 141 makes use of the college radio station to broadcast one section of the course to all five colleges of the Maricopa County Community College District. This course, a one-semester survey in the appreciation and literature of music, has traditionally been among the most popular on the Phoenix campus. By the end of registration, nearly all sections are closed, even though from eight to ten sections are offered in the day and usually four sections in the evening. However, so that one instructor can be responsible for many students, the program is broadcast, and students are given the choice of enrolling in the conventional self-contained mode of instruction or in the course taught by radio.

The same text and lecture content are used in both instructional modes, but, in the radio broadcast section, the topics of the lectures are available for student use in the listening laboratory for further study or make-up. A series of 30 lectures is recorded on cassettes and two one-hour programs are broadcast each week. The musical selections are coordinated (on cues given in the lectures) by a radio station technician.

The conventional instructional mode consists of 32 lecture-demonstrations per semester. The students meet each week for two one-hour sessions where they are exposed to films, filmstrips, still pictures, and recordings at the discretion of the individual instructor. The students are encouraged to listen to many of the recordings via cassettes kept in the listening laboratory.

Students are evaluated through examinations in both instructional modes, but since students from all five community colleges are enrolled in the radio course, examinations are sent and returned through the mail.

The instructor enjoys teaching the course through broadcasting because it allows his teaching schedule to be more flexible. He mentioned, however, that he misses not having any contact with the students. When asked whether he would recommend the use of radio in teaching other courses, he replied that the nature of the course and the ability of the instructor should be considered before deciding on such use.

PSYCHOLOGY 100: SPRING 1971

Orange Coast College
(Coast Community College District)

Psychology 100 is required for all students who hope to earn the Associate in Arts degree. The course, as now taught, has the dual purpose of introducing the student both to the discipline of psychology and to his counselor. Students are introduced to the scientific methodology of psychology, with emphasis on precise definitions of terms and on accurate statements about psychological phenomena. Students become acquainted with selected findings, principles, theories, and applications of psychology. In counseling and guidance, the students are provided with information to assist them in coping with their role as college students, and to aid them in the general educational and vocational decision-making process.

The course uses a large group instructional mode. It meets each week for two hours in a large assembly meeting and one hour in a small group session. While a team of expert instructors alternates in giving lectures in the large group meetings, the purpose of the seminars is to facilitate application of the principles and concepts presented in the lectures to the students' present and future activities.

The instructor and the division chairman reported that preparation and revision of the lectures for the general assembly sessions take approximately 10 to 15 hours per week. Both staff members believe that the Psychology 100 instructors do not need released time to revise the course materials, since they receive double credit for teaching large groups (3-1/2 hours of lecturing for 7 hours of credit).

The staff members pointed out, however, that revisions need to be made in the course materials. For example, they need new, updated audio and visual materials. To improve evaluation further, the instructors are continually reviewing the results on test items and trying to refine and clarify the objectives of the course.

The two men commented that, by and large, the lectures are excellent, judged by what can be accomplished through the lecture system. These lectures are made more effective by the extensive use of films, slide transparencies, and videotapes.

Two full-time instructional assistants take attendance, operate the hardware for the general assembly session, perform clerical duties such as typing tests and recording grades, and record the lectures on the audiotape. One laboratory assistant is employed for 15 hours a week to support the instructional assistants.

Even though the unique feature of Psychology 100—introducing psychology with counseling—has been successful, when asked whether he could recommend that other courses attempt a dual purpose, the division chairman suggested that this blend might be difficult for them to achieve.

SOCIAL SCIENCE 103: SPRING 1971

Cuyahoga Community College

Social Science 103 employs the large group instructional mode to introduce nonmajors to an interdisciplinary one-quarter course in the behavioral sciences. For three hours a week the students meet in large assembly sessions where an instructor gives carefully prepared lectures. On an unscheduled basis, small groups of students meet with instructional assistants to discuss the material presented in the lectures.

The large group approach consists of a three-level hierarchically organized teaching team. There is the major instructor with an advanced degree, a professional instructional assistant with a bachelor's degree, and a two-year college student assistant.

The conventionally organized course is also taught for an eleven-week period. Students meet in classrooms in small groups of about 40. The instructor teaches through informal lectures.

The instructional assistant performs the following duties: (1) tutors students in groups or individually; (2) leads review sessions of basic course objectives; (3) assists individual students in all matters related to successful course completion; (4) supervises the student assistant; (5) researches subject matter for the instructor's use; (6) occasionally makes a lecture-hall presentation; (7) grades essay examinations; and (8) acts as administrative assistant and logistics expert for managing a large number of people and much instructional material.

The chairman of the behavioral science department commented that the instructional assistant makes a special contribution by bridging the communications gap between the instructor and the student. The major instructor often receives feedback from the instructional assistant on student learning problems because students feel that he is more approachable.

The chairman stated that not all instructors are capable of teaching a course using the large group approach. The instructor in this approach should have certain personality traits. He has to be a highly organized individual, willing to take sufficient time to prepare his lectures and manage his instructional and student assistants efficiently.

When asked whether she would recommend the large lecture approach for all courses and other disciplines, the chairman answered that she would, but added that, since objective evaluation is essential in large group approaches because instructors cannot know students on an individual basis, instructors should be acquainted with the principles behind measurement and evaluation.

SOCIOLOGY 211: WINTER 1970

Delta Community College

Sociology 211 uses closed- and open-circuit television in small assembly sessions. This same course had been taught in a conventional mode of instruction, with students meeting each week for three one-hour sessions in a self-contained classroom.

On closed-circuit television, students view each week two one-half hour lectures. These taped lectures are televised seven times per week, so students can attend the sessions most convenient for them. In addition, each lecture is shown twice a week on open-circuit television for viewing at home. Students, if they are interested, can also listen to the audio portions of the taped lectures, which are stored in the instructional laboratory.

After viewing the taped lectures, students are placed in groups of 27 for discussion of the lecture material. Because roll is not taken, however, many students do not attend these small group sessions. The instructor estimates that at some of the sessions, nearly half the students are absent.

When asked whether he would recommend the use of television in combination with small assembly sessions for other courses, the instructor replied that he believes self-directed learners do better under this instructional mode than "weaker" learners. He also suggested that television in conjunction with other media would be a better instructional approach.

SOCIOLOGY 101: FALL 1971

Phoenix College

(Maricopa County Community College District)

Sociology 101 utilizes the large group mode of instruction. The primary objective of this introductory one-semester course is to teach students about their own and other societies. The instructor explains the rationale for the course in this way: "Social life in any complex society tends to isolation according to age, region, social class, occupation, and education. Thus, the student can, at least indirectly, share experiences of North and South, plumber and doctor, Black and White, and perhaps gain some understanding of [what a] free and open society must require in order to survive."

Approximately 125 students are enrolled in each section of the course. They attend each week three hours of lectures, view several tapes and films, and occasionally listen to an outside speaker. In these large meetings, there is only limited discussion. Students purchase a text and reader and may also purchase a programmed study guide and workbook as an optional learning aid.

The same course is also taught in a more conventional mode, with small groups of about 40 students in self-contained classrooms being introduced to the basic principles of sociology. Like those in the large assembly approach, they meet each week for three hours of class lecture.

The primary difference between the two approaches is, of course, in class size. Three times as many students are accommodated in the special science lecture facility as in the conventional classroom. The instructor has taught under both instructional modes. He believes that the large assembly approach requires the instructor to prepare his materials more thoroughly and consequently allows him to "cover more ground in the allotted time." The instructor also commented that discussion is more to the point and audiovisual materials can be used without as much repetition as in small student groups.

Although the instructor spent between 80 and 100 hours during the summer organizing the large assembly approach, he thinks that released time is not needed once the course is initiated. Also, since he feels that the one disadvantage in teaching to a large number is the lack of personal contact with students, he believes that the approach should be limited to an introductory course. "Advanced courses should utilize the small group approach."

CHAPTER IV

THE INDIVIDUALIZED PROGRAMMED MODE OF INSTRUCTION

Increasingly in League colleges, instructors are attempting to provide individual programs of instruction for their students. From past experiences with the conventional mode of instruction, they have learned that it does not meet the varied needs of community college students. Accordingly, instructors rarely treat the class as a single unit, but attempt to create instructional materials that allow their students to proceed through the course at their own learning pace. Unlike the audiotutorial mode of instruction, however, class size does not seem to be an important variable. Examples of effective programmed modes of instruction, designed for both large and small student enrollments, are found throughout League colleges.

Learning Packages

In most cases where instructors have attempted to use the programmed mode, they have prepared learning packages of instructional material for their students instead of using existing programmed textbooks. The many learning packages in League colleges are difficult to discuss as a single unit because they are so varied. They generally consist of clearly defined objectives for each unit, numerous and varied learning activities in which students participate, and some type of unit evaluation. These materials are designed so that the student proceeds through each unit at his own learning pace. Ideally, the learning package materials are written so that few students have any difficulty in comprehending the various concepts or skills being taught.

The Workroom as a Classroom

Unlike under the conventional mode of instruction, the classroom under the programmed mode becomes more a workroom. The students report to their class as they would in a conventionally organized course, but, instead of participating as one of many members of the class, they work by themselves on their own learning packages. The instructor is always present in the workroom to answer individual student's questions; frequently tutors or instructional assistants are available for the same purpose.

In most cases, students are encouraged to report to the workroom on the hours when the course meets, but they have the option of completing their work at home. This open attendance policy is especially suitable for students who must work several hours during the day. Many students in the vocational-technical areas would, in fact, be unable to enroll at all if these courses were organized under a conventional instructional pattern.

The Instructional Laboratory as a Classroom

While workrooms are used by the liberal arts disciplines, many science courses structured under the programmed mode use an instructional laboratory. These learning centers, besides printed instructional materials, use different types of media—in most cases, audiotapes. Students work at individual carrels with a series of learning packages or a programmed laboratory manual. They can stop the audiotapes at any point and listen again to those portions of the tape that caused them difficulty. At certain places in the tape, the commentator directs the students to complete some work in the laboratory or in their laboratory manuals. Paraprofessionals, besides being responsible for opening and closing the laboratories and caring for the equipment and software materials, usually provide instructional assistance for any students requesting it.

Open Scheduling

Ideally, the programmed mode of instruction allows each student to work at his individual pace. This sometimes means letting the students complete the course at any time during the semester or, if necessary, during the following semester. Some League instructors in the vocational-technical areas who are presently teaching at least one of their courses under the programmed mode say that they have had great success with this open scheduling procedure. Many vocational students are involved in work-study programs and consequently have less time for their courses than they need. These students benefit greatly from having the option of completing the course requirements during the following semester without penalty. On the other hand, some vocational students want to accelerate their courses to take an upcoming job. These students also benefit by having the option of completing several of their courses prior to the end of the semester.

Some instructors in the nonvocational areas who have attempted the open scheduling of courses under the programmed mode are dissatisfied with it. With a few exceptions, instructors set limits on the time when examinations must be taken. Either from experience or from a suspicion of college students, they feel that the student who enrolls in community colleges must have deadlines or he will not have the motivation to work. These instructors, therefore, make their students all take the unit examinations that may be given over a period of a week, or complete a specified number of units before a certain date if they do not wish to be dropped from the course.

Other instructors in the academic areas seem more faithful to the original intention of the programmed mode. Without resorting to punitive systems, they allow students to progress at their own pace, leaving their work habits to their own initiative and conscience. Although a high percentage of students do not complete the course at the end of the semester, the instructors are not unduly alarmed. Many believe that their chief function is to make students self-disciplined individuals, and that open scheduling is the best environment to develop this self-sufficient attitude. Perhaps these instructors fear that the high number of incompletes may persuade administrators that their courses are ineffective. They therefore do not want their programmed courses evaluated against conventionally organized courses except in the number of students who successfully complete them.

The Student Contract

One device that several instructors have used to help students become more disciplined learners, or at least to reach goals they have set for themselves, is the student contract. While student contracts have been used for many years in a few courses under the conventional mode of instruction, they seem perfectly suited for courses designed under the programmed mode. Some instructors issue the identical contract to all students and ask them to read it carefully before signing. The contract usually specifies that students devote a reasonable amount of effort and time to the course and may even include a commitment by the instructor himself to be available for individual assistance for all who need it.

Other student contracts are individualized according to a realistic assessment of each student's abilities. In some cases, the student contracts are written after all students have taken a pretest. During the semester the instructor may ask individual students to add items to their contract if there are other skills the instructor feels the students can master. Instructors report that student contracts are effective, especially in courses that encourage students to work in areas of their own interest and need.

The Use of the Paraprofessionals

More than any other instructional plan, the programmed mode uses various paraprofessionals. The nature of the approach sometimes even mandates the help of instructional assistants. Even courses under this instructional mode that use only a workroom, not an instructional laboratory, have a real need for competent paraprofessionals.

The paraprofessionals used in the programmed mode are often students in senior colleges and universities who are planning soon to enter the teaching profession. By spending several hours each day helping students individually in the workrooms, they acquire experience in teaching. Of course, for the course instructor, their help is crucial. Because students are on various units in their learning packages, they need assistance in many different areas. In courses with large enrollments, the instructor will find helping the students very difficult and the students would certainly be discouraged from attending the workroom sessions if they had to wait an undue length of time for help. Therefore, those instructors who employ senior or graduate students find them well suited to their needs, and, since the rate of pay is quite reasonable for college tutors, many colleges can afford to hire them.

Several instructors, for one reason or another, have available only one paraprofessional who spends full time in the workroom sessions. They therefore also use student tutors, who have usually been enrolled in the instructors' former classes and have demonstrated competence in the subject matter of the course. These students usually spend several hours each week in the workroom sessions. In most instances, they receive a minimum hourly rate or some type of honor credit for their tutoring activities. The instructors report that they relate well to the students enrolled in the course. Any questions the student tutors cannot answer can be directed either to the paraprofessional or to the instructor.

Of the instructors who use student tutors in their programmed courses, few use students enrolled in the course itself (peer-student teaching, as it is commonly called). During the initial week of the semester the instructor identifies those students who are willing to work through the learning materials ahead of the planned schedule. These students spend several hours during the week either helping students with individual problems or administering and evaluating unit quizzes. Students usually feel comfortable having their peers provide instructional assistance. In addition, those who help teach their fellow students find that they learn the material far more thoroughly than if they had fulfilled only the role of student.

Besides providing instructional assistance, the paraprofessionals usually help perform the multifarious clerical duties required by courses under the programmed mode of instruction. Since students are in many different places in the course content, paraprofessionals not only help in handling such common data as test grades and attendance records, but frequently keep records of the problems each student is having and the progress he is making. Also, because the instruction has been individualized, students are often asked to complete special exercises or perform other unusual activities needed to master some skill or concept. The paraprofessionals can determine whether these prescriptive tasks have been completed.

Student Evaluation

League instructors teaching under the programmed mode of instruction follow different procedures in evaluating their students. Many, believing that community college students will learn only when they are told to meet deadlines, use rather conventional tests. The score the student receives on the test is recorded as his earned grade for each particular unit. In most cases, these instructors allow only a specified time for each test.

Many instructors using the programmed mode specify that students must demonstrate a certain level of competence on the unit tests. To progress to the next unit of work, they must score at that prescribed level of mastery. Since most students score below the accepted level the first time the test is given, the instructors have prepared alternate forms of the test. Students who score below the accepted master level are usually directed back to the unit for further study, and, when they again feel they are ready to take the test, they are given an alternate form. If they score at the accepted level on this attempt, they will be directed to the next unit of work. Otherwise, they will still need to study the unit further.

Most students are successful on the second form of the unit test. The few who continually score below the accepted mastery level are directed to the instructor, who attempts to assess the student's difficulty. He sometimes discovers that the student has not been spending enough time working on his learning materials and is trying to pass the tests without sufficient preparation.

Instructors who prepare alternate forms of their tests are being most faithful to the oriiginal intentions of the programmed mode. Students should have enough opportunities to demonstrate the expected level of competence, but this requires the help of a paraprofessional to handle the heavy record-keeping. In addition, the instructor must spend much extra time in preparing the alternate forms of the test. The time required to assemble a test with some degree of validity is difficult in itself, but having to prepare several forms of each test, each with the needed validity, is a monumental task. However, those instructors who have already assembled the alternate forms of the unit tests (or who are now doing so) find it a necessary and worthwhile effort if they expect to individualize instruction for their students.

Programmed Tracking According to Individual Needs

In composition courses and courses in the social sciences, the instructors may assign units on the basis of individual student needs or allow their students to choose the units that most interest them. These instructors usually require a minimum number of assignments to be completed before the end of the semester, the rationale being that students will learn best whatever interests them most. Of course, this approach may or may not be suitable in all disciplines. For example, science courses may require all students to work through the same units for comprehension of the course content. Even in these courses, however, some instructors hope that, in the future, they can allow individual students to perform experiments that most interest them, rather than ask all students to complete the same set of experiments—even though such completion may be at their own learning pace.

The Programmed Mode Instructor

In the final analysis, the most important variable in the programmed mode of instruction is the instructor himself. League instructors presently using this approach report that a tremendous amount of time and effort are required to assemble the instructional materials in the form of learning packages. Moreover, they have to spend additional time revising the materials as they receive feedback from the students. Although they hope that in time their learning packages will be so well developed that they will no longer need revisions, this process may well take several years.

Besides the time and effort required for preparation of instructional materials, the instructor using the programmed mode may well find that his role has changed from teacher to learning manager. Because he is no longer treating the class as a single unit, he can now work with individual students as they progress through their assignments, trying to structure the learning environment to meet the needs of each.

In some ways, the instructor of the programmed mode is a confidant of his students. Instructors who feel most comfortable lecturing to their students—and not becoming any further involved with them—will most likely not enjoy teaching under this instructional approach, since they will have to work on a one-to-one level with their students. On many occasions, League instructors spend time listening to their students discuss confidential matters, and realize that becoming involved in their personal problems is often necessary if they are to help prepare the students for learning.

One cannot stress too strongly that the success of the programmed mode depends greatly on the efforts of the course instructor. Thus, instructors who dislike spending many extra hours preparing instructional materials and constantly revising them, who also see their role as a teacher and not as a learning manager, and, finally, who do not want to involve themselves directly with their students, will not likely be as successful as those who are more amenable to the unique requirements of this individualized teaching plan.

THE COST OF INDIVIDUALIZED PROGRAMMED COURSES

Most courses under the programmed mode have a lower per-pupil cost than their respective conventionally organized courses (see Table IV-1). These costs are computed on the actual enrollments that League administrators and instructors have reported. The programmed courses direct instructional cost ranges from a low of $28.76 to a high of $120.00; the mean per-pupil cost is $63.27 (excluding the Dictation-Transcription I course at Brookdale Community College, since it has no matching conventional course). The conventionally organized courses' direct instructional cost ranges from a low of $9.08 to a high of $181.57; the mean per-pupil cost is $74.63.

Although these are not random samples, they serve as examples of what League administrators and instructors believe might have been "highly productive" in terms of their costs. The data collected seem to show that courses taught under the programmed mode of instruction may, in many if not most instances, have a somewhat lower per-pupil cost than courses taught under the conventional instructional mode. In addition, these per-pupil costs for programmed courses are even lower when computed on their optimum enrollments (see Appendix B).

Table IV-1

A COMPARISON OF DIRECT INSTRUCTIONAL COSTS BETWEEN COURSES UNDER THE INDIVIDUALIZED PROGRAMMED AND THE CONVENTIONAL MODES OF INSTRUCTION

Name of Course	District Where Course Is Given	Individualized Programmed Cost per Pupil	Conventional Cost per Pupil
Accounting 142	Moraine Valley Community College	$ 28.76	$ 38.24
Automotive Electronic Repair	Central Piedmont Community College	91.25	101.39
Data Processing I	Foothill Community College District	91.29	124.00
Developmental Math. and Elem. Algebra	Junior College District of St. Louis	31.45	61.87
Dictation-Transcription I	Brookdale Community College	120.00	N. A.
Economics II	Junior College District of St. Louis	41.83	45.64
Electronic Repair 50	Los Rios Community College District	107.11	181.57
English 1	Los Angeles Community College District	79.74	52.02
English 28	Los Angeles Community College District	104.14	48.77
English A	Los Rios Community College District	51.92	53.63
English X	Los Rios Community College District	40.82	75.90
General Physics	Santa Fe Junior College District	34.12	48.83
Graphic Arts 50	Los Rios Community College District	97.53	104.11
Keypunch and Data Recording	Maricopa County Community College District	114.16	157.33
Mathematics 30 and 31	Los Angeles Community College District	80.11	54.12
Mathematics 117	Moraine Valley Community College	44.51	9.08
Physical Science 1	Junior College District of St. Louis	25.96	142.53
Physical Science 121	Santa Fe Junior College District	27.56	56.25
Political Science 101	Moraine Valley Community College	58.91	60.52
Psychology 1	Los Angeles Community College District	83.94	48.00
Psychology 101	Maricopa County Community College District	30.38	28.83

THE EFFECTIVENESS OF INDIVIDUALIZED PROGRAMMED COURSES

In comparing the programmed and the conventionally organized courses *both* by the students who have successfully completed them and by grade distributions, no consistent pattern develops (see Table IV-2). Several programmed courses with a lower per-pupil cost than their matching conventional courses appear to be more effective according to the number of students receiving credit and the distribution of higher grades. In other cases, they are *not* as effective when measured by the two variables of "credit given" and "higher grades." There are even a few examples of conventional courses with a lower per-pupil cost than their matching programmed courses that are also more effective when judged by "credit given" and "higher grade distributions."

While the examples of programmed courses in this report are not objectively more effective, instructors say that, judged on a subjective basis, they are definitely superior to those under the conventional mode. The following examples show both the procedures students follow in courses under the programmed plan and the instructors' subjective evaluation of them.

Accounting 142: Fall 1971

Moraine Valley Community College

Accounting 142 is a one-semester course designed to prepare freshmen for employment through the Junior Accounting Level. The standards and objectives of the course have been determined by the Accounting Advisory Committee and the American Institute of Certified Public Accountants.

The course, organized on a self-pacing programmed mode, is divided into eleven units, each containing about 15-25 specific behavioral objectives. With the exception of unit eleven, each unit corresponds to a chapter in the textbook. To complete the course, the student must pass an examination, composed of both problems and objective questions, in each of the eleven units.

The students meet for two lectures a week (a total of three hours per week), and examinations are administered individually. When a student has completed the written assignments as indicated by the unit objectives, he reports to the Learning Resource Center at his own discretion and on his own time to take one of the examinations. All the examinations have been reproduced in advance and kept on file in the Learning Resource Center. The instructor picks up the examinations daily for grading, and students are required to see him during office hours for test results and possible retesting.

In the spring of 1971, the instructor taught Accounting 142, covering the same course material as he did the next fall. The students also met in lectures each week for two 1-1/2 hour sessions. However, the course was structured in a more conventional manner—whereby the class as a unit took the examination, with no chance for make-up and at a time when each student might or might not have been prepared.

Table IV-2

A COMPARISON OF LEARNING OUTCOMES BETWEEN COURSES UNDER THE INDIVIDUALIZED PROGRAMMED AND THE CONVENTIONAL MODES OF INSTRUCTION

Name of Course	District Where Course Is Given	Individualized Programmed		Conventional	
		Percentage of Students Completing the Course	Student Grades (Weighted Index)	Percentage of Students Completing the Course	Student Grades (Weighted Index)
Accounting 142	Moraine Valley Community College	N. A.	N. A.	N. A.	N. A.
Automotive Electronic Repair	Central Piedmont Community College	90.62	3.50	84.21	2.66
Data Processing I	Foothill Community College District	62.50	2.12	86.67	2.40
Developmental Math. and Elem. Algebra	Junior College District of St. Louis	64.70	2.46	80.00	1.90
Dictation-Transcription I	Brookdale Community College	60.00	1.80	N. A.	N. A.
Economics II	Junior College District of St. Louis	75.00	2.00	63.64	1.73
Electronic Repair 50	Los Rios Community College District	95.00	N. A.	56.67	1.37
English 1	Los Angeles Community College District	84.21	2.25	61.90	1.24
English 28	Los Angeles Community College District	42.37	1.20	70.37	1.64
English A	Los Rios Community College District	17.13	.81	62.22	.81
English X	Los Rios Community College District	46.03	N. A.	68.18	N. A.
General Physics	Santa Fe Junior College District	N. A.	N. A.	37.93	1.21
Graphic Arts 50	Los Rios Community College District	85.71	2.17	57.14	1.40
Keypunch and Data Recording	Maricopa County Community College District	78.36	2.52	61.90	2.32
Mathematics 30 and 31	Los Angeles Community College District	N. A.	N. A.	N. A.	N. A.
Mathematics 117	Moraine Valley Community College	59.04	2.22	81.82	2.18
Physical Science 1	Junior College District of St. Louis	71.43	1.86	86.67	2.47
Physical Science 121	Santa Fe Junior College District	87.50	2.79	100.00	2.90
Political Science 101	Moraine Valley Community College	76.47	2.21	96.97	2.61
Psychology 1	Los Angeles Community College District	75.76	2.39	76.47	1.84
Psychology 101	Maricopa County Community College District	70.00	3.25	72.06	1.78

As for the instructor's time, the self-pacing course requires approximately five hours a week of additional office time so that he can meet the students individually. He feels that, as his student enrollment increases, he is spending too much time in student conferences, but that the individualized approach can be successful if the enrollment is kept low.

AUTOMOTIVE ELECTRICAL SYSTEMS: FALL 1971

Central Piedmont Community College

Automotive Electrical Systems is an eleven-week course intended to provide the student with the technical knowledge necessary to service the electrical systems of automobiles manufactured by Ford, General Motors, and Chrysler.

It uses a programmed mode of instruction. Students work for a nine-week period in an instructional laboratory for approximately 14 hours per week Before they begin working at each of the carrels, they must work intermittently through six units on basic electrical theory. At each of the six carrels is a rear-screen projector that displays a filmstrip and plays recorded tapes in the form of cassettes. The filmstrips, which contain a 30- to 40-minute presentation, are made available by automobile manufacturers. Students demonstrate their knowledge of this material on written tests and their grades are recorded by the instructor.

After the students have demonstrated the appropriate theoretical knowledge, they work through the individual learning packages on the various components of an automobile's electrical system; i.e., the starter, the generator, and the distributor. No two students have to progress in any prescribed order of priority. Each carrel has a 35-mm projector-recorder-playback device with trays that hold up to 36 slides. Each slide is surrounded by a magnetic sound disc (sound-on-slide) with up to 35 seconds of narration. The commentator begins each lesson by stating the objectives to be achieved—each objective worded in behavioral terms.

At each work carrel are kept both the actual equipment component and the programmed learning packages. The students, of course, can work through the program at their own pace, but they receive credit for the unit only if they can demonstrate the correct use of the equipment component. Those who finish the prescribed number of units before the end of the nine-week period are no longer required to come to class.

A two-hour seminar is held each week to discuss any material the students think important, and the remaining two weeks of the course are spent in the automotive laboratory where the students must perform three different tune-ups successfully. In this laboratory, each student is directly involved in the activities.

The course was last offered under the conventional mode in the fall of 1968. Students under this approach worked in the automotive laboratory for 12 hours per week during the entire eleven-week period. They were usually divided into small units of four and, as a unit, manipulated the automotive component being taught each week. One difficulty with this traditional presentation was that only one of the four students would be actively involved; the other three merely watched him perform the task. Another difficulty was that all students had to participate in the same learning activity at the same time. Because of this lock-step, students who worked faster than the others were bored; those who needed more time to grasp each concept were frustrated. The students spent four hours a week listening to lectures on the theory of electrical systems, but no individualized instruction was given in these sessions.

The instructor spent approximately 400 hours preparing the various learning packages for the programmed course. While at first he prepared these programs single-handedly, other instructors now help create additional learning packages. Surprisingly, the instructor found that to prepare the course under the conventional approach would require as much time as under the programmed mode.

The students unequivocally enjoyed their learning experiences in the programmed course. They appreciated being able to progress at their own rates of learning without having to compete against one another. As a result of his successful experience, the instructor recommends the use of programmed modes of instruction for other vocational subjects. He believes both majors and nonmajors can benefit from them.

DATA PROCESSING I: FALL 1970

De Anza College
(Foothill Community College District)

Data Processing I is an eleven-week course designed to provide the general student with a knowledge of present and future computer applications. The students are introduced to the structure of computers and algorithmic languages. They also begin to learn to write computer programs using FORTRAN IV for problems. At the conclusion of the course, the instructor wants students to be able to solve problems in their chosen field on a third-generation computer.

The course uses both a programmed instructional mode and a conventional mode. In the programmed mode, students are allowed to enroll in one-hour laboratory sessions, totaling four hours each week. They also meet as a total unit for one hour each week in a test-and-review session. In the conventional mode, the course requires students to meet three hours per week as a unit to listen to traditional lectures and another two hours per week in a laboratory.

Under the programmed mode, students usually spend twice as much time in the course laboratory learning to write computer programs. A small portion of the students' four hours in the laboratory is spent, however, in one of the campus libraries listening to 20- to 30-minute tapes, while following an accompanying course syllabus. They can, of course, stop the tapes at any point and replay difficult portions. These materials were prepared by the course instructor when the college provided him with an extended contract for 150 hours of labor.

Students under the programmed mode receive weekly quizzes during their one-hour test-and-review sessions; those under the conventional mode get only four quizzes during the quarter. Under both instructional modes, students' programs are evaluated and a final examination is given.

Students in the programmed mode continually tell the instructor that they thoroughly enjoy learning the materials the way the course is organized. They appreciate being able to work at their own pace and to receive most of the instruction through the audiotapes. Their only complaint is that, during the laboratory hours, the instructor is not able to spend enough time with individual students. The course under the programmed mode uses no paraprofessionals to help instruct students.

During the interview, the instructor recommended that both modes be used for teaching the course, even though he feels that the programmed mode is more effective in learning outcomes than the conventional mode. He believes that a small percentage of students need the special kind of attention they receive in a course taught by the conventional mode. On the other hand, students who are self-motivated can benefit greatly from the programmed mode, which gives them much more freedom by releasing them from attendance at specified lectures each week. At the present time, the instructor is teaching the course under the conventional mode, and one of his colleagues is teaching the course under the programmed mode. This same colleague is also helping the instructor revise many of the tapes and the material in the syllabus.

DICTATION AND TRANSCRIPTION I: WINTER 1971

Brookdale Community College

Dictation and Transcription I is a third-semester course in shorthand and transcription. Its major objectives are that students develop (1) a minimum shorthand speed of 100 words per minute and (2) a minimum transcription rate of 30 words per minute.

The course is structured upon the programmed mode with tapes, 8mm film-loops, and printed materials to be used by the students in their progress through the course. Students spend approximately four hours per week in a learning laboratory, but they can work during the hours most suitable for them. Since they work at their own rates of learning, they can finish the course in less than one semester.

The course is divided into a series of units, each listing a set of behavioral objectives. Included with each objective are the methods of evaluation. Students can attain one of the three levels of success, depending on how many of the objectives are completed: (1) credit; (2) credit with honors; and (3) credit with high honors.

The instructor believes that students do well under this mode of instruction because they are allowed to progress at their individual rates. They do not feel frustrated and develop a degree of independence that allows them to adjust to an office setting later on.

While the instructor has taught this course for two semesters, it took about one semester for the learning packages to be prepared. She suggests that released time be provided to allow instructors ample time to prepare materials for courses designed in the programmed mode.

Although the instructor spends 20 hours a week at her teaching station, she can perform many different duties while there. For example, she helps individual students having difficulty with the course work or spends time preparing or revising the course materials. Because, in effect, she is helping the group of individual students (each working on different objectives or even different units), she feels that her role has changed from one of teacher to one of office manager.

The major improvement the instructor wants to make, besides revising some of the course materials, is to modify the learning laboratory so that it will resemble a business office. She is enthusiastic about the learning laboratory, since students are provided with more individual attention.

ECONOMICS II: FALL 1970

Forest Park Community College
(Junior College District of St. Louis)

Economics II is a second-semester course in the study of micro-economics for freshmen and sophomores. Two sections of the course are offered, using contrasting modes of instruction. One section uses a conventional approach, with students meeting for three hours per week in a small classroom group. The other section uses programmed instructional materials, and students meet as a group only for testing. The instructor is, of course, available for any students who need individual help, but the major source of learning is the programmed material itself.

Neither of the courses is self-paced in design. Just as most conventionally organized courses require students to complete a unit within a specified time, the programmed course requires all students to be tested at the same time. Thus both courses use forced-pacing to ensure that students will continue throughout the semester to complete the required readings for each unit.

Although the instructor has no control over which students enroll in either section, he believes there is no significant difference between the two groups. He also feels that any differences in student performance between the two groups is attributable to the different instructional materials used: in the conventional mode, a typical economics textbook; in the programmed mode, the same textbook in conjunction with programmed materials.

The same post-test administered to both groups of students reveals no significant difference in their scores, but another test on the identical material one year later shows that the students in the programmed instructional mode score significantly higher than those in the conventional mode. Thus, the instructor feels that his programmed instructional mode is more effective than the conventional in helping students to retain material in economics for a longer period of time.

At the completion of the semester, students were administered an attitudinal survey. The results show that students in the programmed instructional mode feel somewhat cheated because they were denied the right to class discussion such as enjoyed by the students in the conventional section, who were able to meet in lecture-discussion groups. Thus, the instructor believes that if programmed materials are used, much greater contact with the instructor should be provided. He also feels that programmed materials should not replace the conventional and highly beneficial classroom discussion component, but are ideally suited for courses where the teacher wishes to concentrate more on public policy issues. By employing programmed materials, students can proceed through the standard theory in one-third to one-half the time normally needed in the classroom. In this way, class time can be allocated to far more provocative topics. "Instruction is a bilateral process, and whenever one of the elements breaks down, the effectiveness of instruction decreases."

ELECTRONIC REPAIR 50: FALL 1971

Sacramento City College
(Los Rios Community College District)

Electronic Repair 50 uses a programmed instructional mode to introduce students to the fundamentals of the course. Students are allowed to enroll at any time during the semester, can complete the course at any point during it, or can take as many semesters as they wish to complete the course.

Each student who enters the class is given a learning system guide (L.S.G.), which is basically a systematic approach to clearly specified objectives. It contains the objectives, the activities to be followed to reach the objectives, and the materials and tools needed for each activity. This learning system guide is used in conjunction with audiotapes, slide programs, programmed lessons, self-demonstrations, and other means of transmitting information to the student.

Under the conventional mode of instruction, students were required to spend ten hours per week in a laboratory setting. All students proceeded through the course at the same pace and were tested on the assignments at specified times during the semester. Under the programmed instructional mode, students are permitted to take as long as they wish to finish each assignment. Only when each student feels he has mastered the assignment does he ask to be given the test for it. The students are also encouraged to spend as many hours as they wish each day in completing their assignments.

One disadvantage of the laboratory under the conventional mode of instruction was that students in small groups conducted the experiments that were based on lectures given three hours per week. In most cases, only one student in each group would actively conduct the experiments; the others were passive observers. However, the programmed instructional mode requires that each student himself conduct every experiment, thus providing a pragmatic approach to learning.

A paraprofessional spends 20 hours a week in the laboratory, assisting students with any questions they may have and assuming responsibility for all the equipment in the laboratory. Despite the help of the paraprofessional, however, the instructor himself still spends long hours in the laboratory assisting students in every way possible. He believes that the success of the individualized mode of instruction depends on the effort of the course instructor to work with each student at least once a day. "You must bring the counseling approach into this instructional mode. The human touch can not be taken out of (it)."

The instructor is satisfied with his new approach to teaching the electronics repair course. He found that students as measured by standardized tests are performing better than those enrolled in the course when it was conventionally organized, and that the disadvantaged student appears to perform better under this instructional mode.

Because many of the students who enroll in the course frequently leave suddenly to take employment, the flexibility this instructional mode permits is well suited to their needs. The open structure of the course encourages students to re-enroll at any time they feel the need to develop or extend their vocational skills in the field of electronic repairs. The great majority of these students would never re-enter the course if, in a purely conventional instructional mode, it required students to finish a specified number of assignments in a prescribed amount of time.

ENGLISH A: FALL 1971

American River College
(Los Rios Community College District)

English A is designed to help students understand language characteristics and function and to demonstrate how they may learn to write, revise, and edit effective sentences.

It uses a programmed mode of instruction, enabling students to proceed through the learning materials at their individual learning pace. Students purchase a programmed text, entitled *Commanding Communication*, written by the course instructor. The text consists of eight units, each followed by a quiz on the material in the unit, a pretest, and a final examination. Each unit contains several short lessons followed by exercises that allow students to apply the concepts learned. Some are objective and students can receive immediate feedback by checking their answers in the back of the text. Other exercises require the student to write sentences to fit certain patterns, combine ideas in specific ways, and generate original sentences.

At the workshop sessions students can get help from the instructor or from course tutors. Instruction is completely individualized. The instructor strongly suggests that students spend four hours a week in these workshop sessions, but allows them to work outside of class if they wish and to report to class only once a week.

Whenever students desire, they are administered a unit quiz on which they must answer 85 percent of the items correctly. Those scoring below this level of success are provided with second and third forms of the test after having spent additional time reviewing the material. The reason the instructor requires students to master each unit is that the subsequent material is always based on the preceding sections. If the students have too many information gaps, they can not pass the final examination.

In addition to course tutors, there is one paraprofessional in the workshops to help the students. Because she has a college major in English, she can also answer some of the tutors' questions. She evaluates all the students' quizzes, answers questions regarding their scorings, and performs most of the clerical work.

The instructor estimates that she has spent a thousand hours a year over a three-year period developing and revising the programmed text. After the materials were developed the first time, she worked closely with students and made revisions based on their problems or comments about items or sections in the lessons. At the present time, the materials have been completely rewritten about seven times. While the present book has essentially the same content as the original, the presentation is very different from the first version.

The instructor believes that skill courses for remedial students have to be handled individually if instructors are to get them to the point where they can function successfully in their college classes. The programmed mode also allows an instructor to differentiate his instruction between vocational and nonvocational students. As the instructor commented, "The fundamentals about language I teach are necessary for the four-year student to know. If I have vocational students who seem to struggle with the material, I try to adapt it to their needs because they will probably not do the kind of writing demanded by the four-year college courses."

ENGLISH X: FALL 1971

American River College
(Los Rios Community College District)

English X is a remedial course designed to teach the basic skills of written composition to freshmen. It uses a programmed instructional mode.

Unlike the conventional mode, which required students to meet three hours per week in a self-contained classroom, the programmed mode permits students to report three hours a week to a workroom, where they are given printed material divided into six separate units. Each unit is designed to instruct students individually by offering the material in small, sequential steps. Both a full-time instructor and several tutors are present to answer questions. Materials can be completed at home as well as in the workroom but, periodically, students are asked to have specific writing exercises evaluated by the instructor.

When students have completed each unit, they are appropriately tested in the testing room, which is coordinated by a paraprofessional. As soon as the test is completed, it is given to the paraprofessional and returned to the student at the following workroom session. The instructor holds a post-test conference with the student to evaluate his performance. If the student has not demonstrated that he can write at an acceptable level for the particular unit, he is directed back to the material in the unit and, when ready, given an alternate form of the test. The instructors estimated that approximately 50 to 60 percent of the students have to take the tests a second time or at least make extensive changes in their essay tests. Perhaps 25 percent of the students have to take the test more than twice.

Three instructors created the programmed instructional materials over a period of about 640 hours. Although the programmed mode requires many more hours of preparation than the conventional mode, the instructors stated that, under the programmed mode, their teaching schedule is much more flexible. Because they have tutors available (many are students who have completed the English 1A-1B courses successfully) in each of the workrooms to help individual students, the full-time instructors have time to complete their other daily tasks.

Students are allowed to work as rapidly as they can through the course. Some students, in fact, complete the course in less than nine weeks of the semester. These students are then allowed to enroll in the freshman composition course, English 1A. Some of them are even able to complete this course by the end of the semester. The students who do not complete the English 1A course receive an incomplete and are allowed to finish the course with the same instructor during the following semester.

There are 14 sections of English X taught by 6 different instructors, but only three instructors actually prepare the instructional materials. "The division of labor helps to create a better quality of work" according to two instructors. In addition, the other instructors involved in the teaching of English X sections provide input for the course materials by reporting any student problems they have noted.

The instructors feel that one serious problem in the programmed instructional mode is that many students do not attend the workshop sessions frequently enough and, consequently, perform unsatisfactorily on the tests. Often students, in evaluating the course informally, state that they want more pressure put upon them. These are usually students who are unmotivated, and the three instructors anticipate making minor changes in the organization of the course that will meet their needs.

Despite this problem, the instructors are enthusiastic about their course as taught under the programmed mode. They feel that both majors and nonmajors can benefit from courses in English and other disciplines taught this way. The majors can benefit greatly from courses that use this learning plan because it permits them to complete the course at any time during the semester.

ENGLISH 1: FALL 1971

Los Angeles Pierce College
(Los Angeles Community College District)

English 1 is a course designed to teach English composition to freshmen. Unlike the conventional course, which requires students to meet three hours each week in lecture-discussion sessions, the course now uses an individualized programmed mode. Apart from the opening six weeks of the course, students are able to function on their own initiative and are not required to come to class. The only exception to this freedom is that students must attend a weekly individualized instructional session with the instructor.

The instructor over a three-year period has prepared an instructional textbook entitled *English Composition: An Individualized Approach*, published by Westinghouse Learning Press. This is the only material students use; no media other than printed material have been used up to the present time.

By evaluating the students at the beginning of the semester through pretests, the instructor attempts to plan an individual program for each student. In fact, the rationale behind the course is that students will be motivated to learn the material they personally need to know. Unlike a composition course under the conventional mode, where students are exposed to much instructional content they have already mastered, the individualized programmed mode asks them to study only the units that their pretests show they need. Therefore, no two students work through the various textbook units in the same order. With the exception of the first two essays (a personal essay and a library resource paper), students are assigned essays solely on an individual basis.

During the opening six weeks of the semester, the instructor publishes a list of topics that will be discussed in any of six weekly hours. Students attend these discussion sessions according to their own personal needs and interests. The instructor does not take attendance.

Because students work alone in developing their writing skills, the instructor's teaching schedule is more flexible than under the conventional mode. He now meets the class only during the initial six weeks of the semester, and meets each student for his individual instructional session.

Since the lecture technique is not used in the individualized mode, as in the conventional approach of treating the class as a single unit, the course allows much flexibility in student scheduling. Students can enroll in the course at any time during the semester. On enrollment, the student is given a pretest and, as a result of its outcome, an individualized program of work is created for him. In addition, students who need more than one semester to complete the requirements (indicated on contracts signed by students when they first enter the class) can finish them the following semester.

The instructor believes that his students enjoy learning composition skills under the individualized approach because a unique program of learning is built around each of their needs. Also, since he does not permit students to begin a new type of essay until they have received a passing grade of "C," the students appreciate having the option of revising their essays until the course instructor deems them satisfactory.

The instructor highly recommends the use of the individualized programmed mode for other courses, for it allows the instructor "to push each student to his maximum ability." However, he believes that not all instructors can adapt themselves to this approach. "The instructor must be skilled in all areas of his discipline. In addition, he needs to be able to relate with students on a one-to-one basis." Since both majors and nonmajors in a discipline can benefit greatly from this individualized approach to learning, the programmed mode can indeed be effective for many other disciplines when matched with the appropriate instructor.

ENGLISH 28: FALL 1971

Los Angeles Southwest College
(Los Angeles Community College District)

English 28 is a one-semester course designed both to provide intensive experience in written usage for students who lack adequate practice and background and to teach them to read with greater understanding and insight. The behavioral objectives are as follows: (1) the student will be able to write unified, coherent paragraphs, and (2) will comprehend facts and concepts found in college-level reading materials as shown in a series of tests.

The course uses a programmed instructional mode to provide individual instruction for the students. After the first week, which is devoted to orienting students to the unconventional course procedures, the class meets one hour per week in small group sessions of about six or eight students. In these sessions, the students discuss any writing problems they are experiencing and read aloud, discuss, and evaluate each other's written work.

At least once a week the students meet the course instructor for a 20-minute period. These individualized sessions are devoted to discussing each student's problem in reading and writing. The instructor prescribes appropriate material for him in a programmed grammar text. Thus, no student in the course works through the text from cover to cover; each is asked to proceed through only those units or parts of units of most use to him. No formal testing is ever given in the course.

The students, on a voluntary basis, can work with one of the tutors if they so wish, spending one to two hours per week in these tutorial sessions. Students are also asked to spend time in the Learning Center listening to tapes on topics related to improving skills in reading and writing.

English 28 is also taught under a conventional instructional mode. The basic purpose of this course is to provide instruction in writing both a good, complete sentence and a paragraph. The course tries to eliminate in the students' writing incomplete sentences, run-on sentences, and other vague and confusing elements. Short stories and poetry are read, discussed, and analyzed, and the vocabulary in these readings is used to supplement the writing exercises.

The students meet as a unit for two one-hour sessions each week in a self-contained classroom. One additional hour is spent in a small group session (half the number of students in the course) to provide more individual attention for each student.

The instructor teaching in the programmed mode spends an estimated 325 hours organizing the course. In contrast, the instructor in the conventional mode spent approximately 10-20 hours organizing his course. The instructor using the programmed mode stresses the importance of providing teachers with some form of released time to organize and revise materials in any course using this mode.

While each instructor is satisfied with his approach, they both feel that offering English 28 under two instructional approaches helps meet the needs of more students. They both realize that certain students respond better to the familiar conventional mode and others, perhaps more self-directed in nature, can succeed under an independent programmed mode. Therefore, the instructors believe that their two courses complement one another and together provide more effective educational services for their students.

GRAPHIC ARTS 50: FALL 1971

Sacramento City College
(Los Rios Community College District)

Graphic Arts 50 exposes students to the fundamentals of producing printed matter. The course, by providing students with learning activity packages, employs a programmed instructional mode. This mode seems quite suitable for the various interests of: (1) students interested in graphic arts as a vocation; (2) students casually interested in graphic arts; and (3) students who plan to use graphic arts to complement other career choices.

Students meet for two one-hour lecture sessions per week. These sessions are traditional in structure, and are identical with the two one-hour lecture sessions given in the conventional mode of instruction. However, while students in the conventional mode then work in a laboratory for two two-hour sessions, following the procedures outlined in the instructor's lecture, students in the programmed mode work at their own pace through learning activity packages. These packages are systematic approaches to achieving clearly defined objectives. When the student has completed the activities (both theoretical and practical) in the package, he asks the instructor or paraprofessional to administer the test. After completing the test successfully, he proceeds to the next learning activity package.

The instructor believes that the programmed instructional mode is more effective for students than the conventional mode because it allows for the individual differences of students. Under the conventional mode of instruction, all students work through the laboratory assignments at the same rate. Needless to say, many students are unable to complete the assignments in the allotted two-hour interval. However, the learning activity packages permit students to progress at their unique pace of learning. In addition, the instructor allows many students to complete only those learning activity packages that interest them. In this respect, the instructor is able to individualize the course for each student.

While the instructor himself prepares all the learning activity packages, he is provided with a paraprofessional who assists students for 20 hours per week. In addition to the paraprofessional aide, the instructor also has junior college students, enrolled in a work-study program, to perform the many clerical duties required by programmed instruction. In contrast, the conventional mode has a secretary who works fifteen hours per week in only a clerical capacity.

Evaluation under both instructional modes takes into account both the scores on written tests and the quality of work done on the class projects, but the use of learning activity packages allows the instructor to include in his student evaluations the progress each is making. Under the conventional mode, the instructor expects all students to complete the same number of assignments; under the programmed mode, he takes into careful consideration the progress of each one.

Purposely, the instructor teaches all his courses, including Graphic Arts 50, every semester. Such a teaching schedule allows his students to complete, for example, Graphic Arts 50 in the following semester by beginning on the learning activity package left over from the preceding semester. Conversely, students are permitted to begin the next sequential course in graphic arts if they finish the learning activity packages of Graphic Arts 50 before the end of the semester. In both cases, they start with the package where they left off, thus making the course completely self-pacing in structure.

KEYPUNCH AND DATA RECORDING: 1970-71

Maricopa Technical College
(Maricopa County Community College District)

Keypunch and Data Recording is a one-semester course designed for students interested in working in computer-assisted fields. Under the traditional mode of instruction, student enrollment was restricted by the number of machines in the classroom. Under the programmed mode, the instructor has converted the classroom into an instructional laboratory, thereby allowing the students more flexibility in using the equipment.

The instructor modified the instructional mode because she realized that during many hours of the day the equipment was not being used to its full capacity. Also, under the conventional mode, all students had to finish the course objectives in 80 hours. Now, under the programmed mode, students can reserve a number of hours during the week for use of the laboratory and its equipment. Since the laboratory is open from early morning until late evening, they are free to choose the classroom hours most convenient for them.

One additional distinct advantage of the instructional laboratory approach is that students complete the required 80 hours of work at different times throughout the semester, allowing the instructor to help place them in a keypunch job. Under the conventional instructional mode, where all the students finished the course in one group, the instructor found placement of all the students very difficult, for there were not enough positions on the labor market to absorb them all at one time.

Because the course is designed to be self-pacing, the instructor has to prepare learning packages for individual student use. She required approximately four months to complete this task and, at present, she is in the midst of revising and improving the audiotapes. She stressed the importance of released time, preferably in the form of an extended summer contract, to organize any self-pacing course.

The instructor recommended that the programmed instructional mode be used for other vocational areas. "Since students finish the course at different times, they can be placed in the labor market much more easily. And the major objective is to place students in jobs."

MATHEMATICS 30 AND 31: FALL 1971

Los Angeles Southwest College
(Los Angeles Community College District)

Mathematics 30 and 31 employ a programmed mode of instruction to teach basic arithmetic and algebra to college students. Both courses allow students to spend as many hours as they wish in the instructional laboratory and to take as many semesters as they need to finish the course. Commercial audiotapes and a programmed text are the means of self-instruction. However, both course instructors are always present during the laboratory hours to provide individual help for students. Three student tutors are available to help and to perform clerical duties in the laboratory.

Students are tested after they have completed each unit. After the instructor has administered the quizzes, he immediately decides whether the students have demonstrated that they have mastered the mathematical concepts for each appropriate unit. If the instructor feels that a student can perform better, he is directed back to the unit for further study and later administered an alternate form of the quiz. This procedure is followed throughout the semester. Periodically, students are given tests covering several units, but no alternate forms of these tests are available for students who have not performed well the first time. These tests are used to determine course grades.

The instructors believe that the most important factor in their instructional mode is the amount of time they work with the individual student. While the tapes and programmed text are important in tutoring the students, the help of the instructors is still the critical component of the course. Both instructors comment on the many courses they have observed in nearby colleges, where extensive use of software and hardware is sometimes substituted for the instructor, who is not always available for tutoring.

Mathematics 30 and 31 are also taught under a conventional mode. Both courses meet in a self-contained classroom (students in Mathematics 30 for three one-hour sessions and students in Mathematics 31 for five one-hour sessions). Both instructors enjoy teaching under this instructional mode, although, in the early part of the semester, they recommend that specific students enroll in the course under the programmed mode, because they feel that, based on homework and exams, certain students need to move through the material at their own pace.

The instructors of the conventional courses spend far less time either in organizing their courses or in preparing and revising instructional materials than do the instructors under the programmed mode. They make some changes in their courses each semester, but they are not fundamental. In the future, when carrels will be available, the instructors of the programmed courses have decided to assign individual students blocks of time for their use. This will avoid having too many students using the laboratory during certain prime hours, but students who wish to use the laboratory in hours other than those assigned to them may do so if any carrels are open. The general college learning center will also be available for listening to audio materials.

The four instructors believe they are meeting the needs of all their students by offering each course under two different modes of instruction. While each instructor is contented with teaching under his respective mode, he believes that a contrasting mode—especially one that allows for self-pacing—provides a better opportunity for all students to learn the necessary mathematical skills.

DEVELOPMENTAL MATHEMATICS AND ELEMENTARY ALGEBRA: FALL 1971

Meramec Community College
(Junior College District of St. Louis)

Developmental Mathematics and Elementary Algebra are remedial courses for entering freshmen. To handle increasing numbers of students who need to acquire the basic fundamentals of mathematics and algebra, the courses use a programmed instructional mode that allows students to spend as much time as they need in the mathematics learning laboratory to work through each unit. Those who complete the units before the end of the semester are given an earned grade at that time. Students who have reached a specified unit at the end of the semester, without having completed all of the units required, are allowed to receive an incomplete and encouraged to finish the remaining units the following semester. (To receive the incomplete mark, the student must himself initiate the paper work.) Any student who has failed to reach a certain unit, either in developmental mathematics or algebra, is dropped from the course and receives no credit.

The instructor has prepared extensive programmed materials for both developmental courses. (These materials are currently being published under the following titles: *Arithmetic for Self-Study; Elementary Algebra for Self-Study; and Intermediate Algebra for Self-Study.*) After a student has completed a unit, he is administered a short test. If he scores at 80 percent, he is allowed to proceed to the next unit. If he scores below 80 percent, he is guided back to additional material and given an alternate form of the test. Most students find that, by the second form, they are able to meet the minimum requirement of 80 percent success. There are, however, two additional forms of the test, for those students who need further preparation to develop the necessary knowledge to continue with the next unit.

The mathematics learning laboratory is staffed by both full-time instructors and paraprofessionals. Whenever the laboratory is open, at least one regular staff instructor is present, but the paraprofessionals are available to handle most of the students' questions. They also help with the extensive record-keeping, an integral part of any individualized instructional mode, that allows the instructor to evaluate a student's over-all performance at any time during the semester.

While the instructor is enthusiastic about the mode of organization, she noted that it is better suited for the self-directed or self-disciplined student. As the two courses are designed, students who do not spend enough hours in the learning laboratory cannot complete the minimum required units by the end of the semester and will find themselves "dropped" without having earned any credit. However, for those students who are willing to spend at least three hours per week in the laboratory, this programmed mode is very effective for teaching developmental work.

MATHEMATICS 117: SPRING 1971

Moraine Valley Community College

Mathematics 117 is a six-week course in elementary probability offered in the programmed mode of instruction. Instead of meeting in a self-contained classroom for three hours each week, students proceed to the instructional laboratory where they are exposed to an audio and visual presentation for four of the nine units in the course. These presentations are placed on combination sound-slides, and the students work through the material at their own pace. Since the instructors did not have time to rework the presentation component of the remaining units into learning packages, the students attend lectures on these units in a self-contained classroom.

The students are tested on all nine units through the use of the computer (IBM 2740 terminals). Criterion-referenced measurement is used to ascertain whether students have achieved the objectives; the score varies from objective to objective but averages about 80 percent. This level of achievement becomes the level of "mastery learning," and no student can finish the course unless he first achieves it. Consequently, students either "pass" or "do not pass." A grade of "A" is assigned to the former and a grade of "X" to the latter.

The two instructors who created the learning packages and wrote the program spent 60 hours per week the preceding semester and summer in organizing the course. In addition, the instructors together spent 20 hours per week preparing and revising materials during the course.

Despite the vast amount of time they spent in reorganizing the course into the programmed mode, both instructors highly recommend it for other disciplines. The following paragraph, written by one of them, conveys his enthusiasm for and faith in the learning packages composed for the course:

> ### AUTOMATED LEARNING PACKAGES
>
> The automated learning packages we almost completed last year can do everything a teacher can do with respect to a specific behavioral objective, and still retain a HUMANISTIC flavor despite the automation of the teaching techniques. It will do many things the teacher cannot do. It will NEVER forget a student's name. It will ALWAYS be available. It will allow any student to START learning an objective ANYTIME he wishes and give every student as much time as THEY need (*sic*) to COMPLETE the objective. Just as the C.R.T.'s present an instant picture of enrollment in a particular class during registration, an automated learning package can present to the learning manager an instant picture of all the students participating in a certain course, or a particular group of those students (i.e., all those over 21, all females, etc.). Just as the C.R.T.'s present an instant picture to the registrar of a particular student's transcript, an automated learning package can present to the learning manager or one of his student teaching assistants the total progress to date of a particular student in the course either in terms of how far he has progressed or how he has done on all or one of the post-tests, item-by-item! It will provide the student with INSTANT FEEDBACK on EVERY test question as well as instant feedback at the end of the test concerning "acquisition" of the objective. It will provide as many recycles as necessary in order for the student to achieve the objective. It will suggest alternate modes of dissemination if the student is having difficulty with the PRIME MODE (usually a sound-on-slide presentation). If the student encounters difficulties which the automated learning package cannot remedy, it will not allow him to proceed any further until he seeks "human" help. (I wish you could have seen the face of the first student who tried to "beat the system" when he saw typed out on the terminal, "I TOLD you not to go any further until you see your teacher. Please sign off." Furthermore, he would continue to get that message everytime he tried to get back into the

system UNTIL he did see the teacher, and the teacher decided what to do.) It will keep track of anything the learning manager wants it to keep track of. We kept track of number of recycles needed per objective, average response time per objective, total number of questions attempted, total time on computer, etc.

PHYSICAL SCIENCE 1: FALL 1971

Florissant Valley Community College
(Junior College District of St. Louis)

Physical Science 1 uses a programmed approach for instruction. The rationale is that the college cannot recruit enough students in the evening sessions to warrant offering many individual courses in physical sciences. The question was how to accommodate students who need physical science courses but cannot enroll in the daytime sessions. It was decided to create a number of physical science courses for the evening sessions, each structured on a programmed instructional basis. One full-time and one part-time instructor were assigned responsibility for all the evening physical science courses (eleven of them in the 1971 fall semester).

In the evening section of Physical Science 1, as taught in the conventional mode, students met two hours per week in a traditional laboratory. They were required to complete each unit at a prescribed time and were tested together at intervals during the semester. In contrast, under individualized programmed instruction, students are able to spend as many hours in the laboratory during the evening as they need. An instructor is always available to answer questions. The course is forced-paced rather than self-paced, however, in that examinations are given over a specified four-day period. Students are forced to complete a unit by a prescribed time to ensure that they will complete the course by the end of the semester. Experience in self-pacing courses has demonstrated that too many students will not complete the requirements of a course, even after being enrolled for two or three semesters.

The instructor recommends the use of a programmed mode for any evening course with a marginal enrollment. By running simultaneously a number of courses in one area, each of which has too few students to warrant its separate presentation, they become economically practical for a college. However, the instructor also believes that programmed modes of instruction are more effective for either higher ability students or majors of a discipline.

PHYSICAL SCIENCE 121: FALL 1971

Santa Fe Community College

Physical Science 121 is a twelve-week course designed to introduce students to the principles of physics. In an attempt to let students explore the field of science without committing them to long, tedious hours of lectures on theory, the course uses a programmed mode of instruction.

Under the conventional mode, students were required to attend five lectures every two weeks, and spend two and one-half hours in the laboratory each week. In contrast, the programmed mode allows students to meet in the laboratory twice each week for a 165-minute session. No lectures are delivered; students spend their total time conducting both required and personal experiments. Every two weeks, students meet as a unit for one hour to discuss the experiments they have conducted. These one-hour sessions are the only time the class meets as a single unit.

While the laboratory under the programmed mode cannot be considered open, as are those of many science courses using programmed modes, students do work independently or in pairs on their experiments. The instructor writes on the chalkboard which experiments are to be conducted during any particular laboratory session. Using only their commercially published laboratory manuals, students reconstruct each of the experiments the manual describes. They are encouraged to ask one another and the instructor for help. Students who need additional time to finish their experiments can use the laboratory facilities whenever other classes are not present.

While tests are not given on the laboratory work, students must compile a laboratory notebook with the descriptions and results of all of their experiments. Later in the quarter, these write-ups are evaluated by other students so that each student can have the experience of critically reacting to other students' work. These notebooks are finally evaluated by the instructor himself toward the end of the quarter.

The instructor believes that the approach he is using in the laboratory is effective, especially for nonmajors in physical science. "Science is experiencing," he stated, and his course under the programmed mode allows the students to explore experiments on their own and develop confidence because they are, in effect, teaching themselves. Unlike the students in the conventional course, where instructors placed great emphasis on the time students spent listening to lectures, his students become totally involved in the course. Because he feels that allowing students to conduct their own experiments helps them to become more active and to go as deeply into the course content as their interests carry them, the instructor highly recommends that both his course and other science courses be taught under the programmed mode of instruction.

GENERAL PHYSICS: WINTER 1971

Santa Fe Junior College

General Physics is designed to teach introductory physics to nonmajors in the discipline. It uses a programmed mode of instruction to allow each student to progress at his own pace.

Under the conventional mode of instruction, students were required to attend three lecture and two laboratory sessions per week. They were allowed to ask questions during the lecture sessions but, as the instructor stated, "discussions were led from the front of the class." Students conducted experiments in the two hours of laboratory, and were required to complete the experiments within that time.

Under the programmed mode of instruction, students attend only one weekly lecture session. It is comparable to those given in the conventional course, but students also spend one and one-half sessions per week in small discussion groups of six students each. Each group, led by a student discussion leader, covers chapter questions from the course textbook, problems given in the lecture sessions, and any related work that interests them. The instructor works within the different groups and provides assistance when needed.

Under the programmed mode, the course offers an open laboratory where students have a much wider range of hours in which to conduct their required activities. To permit students to tutor themselves—as is done in open laboratories—the instructor prepares learning packages for nine different units. The packages contain the learning activities (experiments, outside readings, and film-loops) required for each unit. (Eventually these packages will also contain the precise objectives the various activities are designed to meet.) They also contain a reading and written assignment and the required problems.

Many of the activities for each unit can be completed by the students at home rather than in the laboratory. Offering the option of completing these activities away from the college allows students who work during the daytime a better chance to complete their assignments. In fact, the only time students are required to work in the laboratory is when they conduct their large experiments and take their tests. Again, the instructor has prepared her own laboratory manual programmed to lead students successfully through each of the large experiments. (Part of these programmed materials were also used in the course under the conventional mode of instruction.)

In the course under the programmed mode, students have a wide selection of activities from which to choose—some basically small-type experiments and others simply readings in related scientific literature. The instructor desires diversity in activities because she wants to satisfy the varied interests of the students, none of whom have yet declared themselves majors in physics.

An unconventional method of testing is followed. Besides being given a relatively flexible period of time in which to take the unit tests, students who receive an unsatisfactory result (scoring below 75 percent) can take up to three alternative tests.

Students who complete all nine units satisfactorily receive a grade of "C" in the course. Those who desire a higher grade are provided with extra credit activities such as more homework assignments, outside projects presented both orally and in written form, and reading one or two outside books.

Even though the instructor spends long hours preparing and revising the nine learning packages, she enthusiastically recommends the use of the programmed mode for other courses in the science disciplines. However, she found that non-majors benefit the most from this individualized instruction because it allows students to select activities that most interest them and, within some limitations, to proceed through the course at their own rate of learning.

POLITICAL SCIENCE 101 AND SOCIAL SCIENCE 101: FALL 1971

Moraine Valley Community College

Political Science 101 is an introductory semester survey of the elementary principles of political science and of American local, state, and national government. In the programmed instructional mode, the instructor has combined the use of the Learning Resource Center with small assembly sessions.

Students are given study guides, prepared by the instructor, that state the objectives and the learning activities designed to help them reach the objectives. When students have completed the learning activities at their own pace, they take, at their convenience, an examination given in the Learning Resource Center. If the student passes the examination at the 90 percent level of success, he becomes eligible to attend a seminar offered approximately five times in one and a half weeks. The student not achieving the 90 percent level is directed back to the study guide for further review and given an alternate form of the examination when he feels he is sufficiently prepared for it.

Discussions in the seminars are quite successful, since all students have mastered the prerequisite instructional material. The instructor need not take time to explain the rote-learned facts, but can concentrate on the higher cognitive learning experiences.

Perhaps the only disadvantage of using this procedure is that the student must complete the activities and successfully pass the examination within a specified time. Since it is only at the seminar that the student performs at higher cognitive levels, he must make certain that he attends every seminar session. At the conclusion of the seminar, the instructor provides each student with the next study guide.

Social Science 101 is a one-semester course given in a conventional instructional mode. Students meet in a self-contained classroom for two 80-minute sessions per week. The first half of the period consists of a lecture or film. In the second half, the instructor usually segregates the students into three smaller units and circulates among them as they discuss relevant topics. The instructor finds assessing the quality of each of the three discussions difficult, since he hears only parts of each. Unlike in the political science course, many students have not prepared themselves sufficiently to participate in and profit from these small-group discussions. Moreover, the instructor can handle fewer students in this course than he can in his political science course. Grades are determined by averaging test scores, seminar grades, and paper grades.

Although the programmed mode required that the instructor spend five hours per week for a two-month period organizing the course (as is necessary for any new course), he recommended very highly that this instructional mode be used in other college disciplines.

PSYCHOLOGY I: SPRING 1971

East Los Angeles College
(Los Angeles Community College District)

Psychology I is a one-semester course that introduces students to the basic principles of psychology. The instructor, who has taught the course for many years in a conventional mode, with about 35 students meeting as a group for three hours per week, now individualizes the instruction by offering the course in a programmed mode. She believes that, except for some needed revision, the individual approach is an exciting and effective way to teach psychology—as well as other disciplines.

Each week students meet for a one-hour session on Tuesday and a two-hour session on Thursday. They are provided with semi-programmed materials published by Independent Learning Systems. In the classroom, students work either independently with the printed materials or in small informal groups. Following the student-peer teaching concept, the instructor uses several student tutors (who have had other psychology courses) to provide instructional assistance for the students. She is also present to help individual students.

After students complete a module in their learning materials, they check their knowledge of the concept by completing a short exercise. Answers to these exercises are provided in the back of the programmed text or, if students wish, can be evaluated by any of the course tutors. In addition to checking these exercises (referred to as "checks"), the tutors ask the students oral questions on each module. The student moves on to the next module or unit if the tutor feels that he has mastered the necessary concepts. If the students are unsure of any concept in the module, they are directed back for further study. They may complete an alternate exercise or check after they have spent more time studying the unit. These checks are never given a grade since, as the instructor mentioned several times during the interview, "mastery is important and not any grade."

An examination is given after the student has completed each of the units in the programmed text. These tests are graded only by the course instructor, and students can take them only once, the score being their grade for that particular unit. At the end of the semester, when a final examination was given to the students under both modes of instruction, the instructor reported that students learning under the programmed mode scored higher than those who attended three hours of lecture each week.

The instructor said that most students enjoy learning the course materials under the programmed mode. They are surprised, in fact, that they have the ability to teach themselves. One student told the instructor that, for the first time in his life, he did not have to guess at the answers to the test items; in this course, he felt as though he knew the concepts behind each one. The only negative criticism came from students who missed being able to attend some lectures. With this point in mind, the instructor stated that when teaching the course under the programmed mode again, she will hold optional lectures, available only for those students who wish to attend them. The instructor hopes that funds will be made available for student tutors so that she and other instructors may offer more of their courses under the programmed mode.

PSYCHOLOGY 101: FALL 1971

Mesa Community College
(Maricopa County Community College District)

Psychology 101 is a one-semester course divided into twelve units of content, each with several modules. Each unit corresponds to a series of student projects and library activities, which are out-of-class assignments.

The programmed mode allows each student to progress through the course at his own pace. After the student completes a unit, a course proctor administers an examination in a room reserved for that purpose. If the student scores below 90 percent, he is told to restudy the unit; only when he is ready is he given form "B" of the examination. If the student is again unsuccessful at the 90 percent level, he is directed back to the unit for further work. Once again, when ready, he takes form "C" of the examination. If again he cannot achieve 90 percent, the instructor holds an individual conference with him to find out the source of his difficulty.

The course meets each week for one hour in a large group meeting and for two hours in a small session. While lectures are given in the large assembly meetings, the small group meetings are reserved for discussion of the required units as well as presentations of course material that can best be conveyed by such group experiences as psychodrama, role-playing, T-groups, or games.

The course under the conventional mode covered basically the same material as does the present self-pacing course but it required all students to move at the same rate of learning. The class met three hours per week in a large group session, where the instructor would present his lectures on the selected course units. Students were tested together on the same material at the same time.

The instructor felt that organizing the self-pacing course took twice as much time as the conventionally organized course. While released time is necessary to organize any new course, extra time is not necessary for on-going courses, for they require only the preparation of additional instructional materials and a minimum amount of course revision.

Now that the instructor no longer takes roll, attendance has not been as high as under the conventionally organized course. He is not disturbed, however, since the purpose of reorganizing the course was to allow more options for the students; each can decide how fast he wants to complete all twelve course units. In fact, those who do not complete all units in the semester can, if they wish, complete any outstanding requirement the following semester.

The instructor, although he finds the programmed mode of instruction effective, believes that colleges should allow various modes. Students, because they learn best under different conditions, should be allowed to choose the instructional mode in which they feel most comfortable, whatever the course.

CHAPTER V

THE AUDIOTUTORIAL MODE OF INSTRUCTION

In its attempt to provide individualized instruction to large numbers of students, the audiotutorial mode integrates several different instructional modes. Each week students in courses under this integrated approach are exposed to the large group mode, the conventional mode, and the programmed mode.

GENERAL ASSEMBLY SESSION: LARGE GROUP MODE

In most of the League college courses that use the audiotutorial mode, students meet early in the week in a general assembly session. While these sessions are patterned after those in the large group mode, they have several differences. Many instructors in these sessions refuse to lecture; rather, they devote the sessions to general announcements that they must communicate quickly to all students. The sessions are also used to motivate the students toward the coming week's work. For this, instructors bring in interesting exhibits or memorabilia likely to capture the students' imagination and interest. Films are shown illustrating concepts to be explored in the coming unit of work and guest speakers are invited to discuss relevant problems and experiences in their own careers.

While nearly 20 courses under the audiotutorial mode were studied, no consistent pattern developed for attendance requirements in the general assembly sessions. Instructors who require attendance have instructional assistants take roll during each meeting. Other instructors highly recommend that their students attend these large meetings, but do not penalize those who do not. Some tell their students to attend meetings only when they feel that they are interested enough in what is being covered for a particular week. Still others hold general assembly sessions intermittently throughout the semester, when there is either course business to announce or a special activity from which students might benefit. Most instructors feel that encouraging students to attend the general assembly sessions, but not making them mandatory, is the most effective policy.

SMALL ASSEMBLY SESSION: CONVENTIONAL MODE

In most instances, students enrolled in audiotutorial courses have the opportunity to meet in small assembly sessions, patterned after the conventional mode where students meet in a self-contained classroom in relatively small groups. Usually, the instructors of the small group session use the lecture-discussion approach, which, unlike the conventional mode, allows more time for student discussions. In many cases, the discussions are based on problems the students have experienced in the instructional laboratory. Sometimes, however, the discussions have originated from an activity conducted in one of the general assembly sessions.

The instructors usually try to create an informal atmosphere so that students will be encouraged to discuss any problems confronting them in the course. In some instances, the instructors use special classrooms such as encounter rooms to help establish the appropriate atmosphere, but an important variable in creating this informality is the number of students in the sessions. Not surprisingly, the larger the enrollment, the more impersonal the session. While many of the small assembly sessions contain between 20 and 25 students, the more successful ones are limited to 15.

In most courses given under the audiotutorial mode in League colleges, the small assembly sessions are offered at various times during the week, usually planned for hours most convenient for the students. However, it is important in planning the most effective times to offer the small sessions to ensure that students will have had prior opportunity to spend some time in the instructional laboratory. Most instructors choose Thursday as the most appropriate day for small sessions.

In the courses under the audiotutorial mode that use team teaching, the team members are responsible for the small sessions. The team leaders usually prepare the instructional material for both the laboratory and the small assembly sessions and take charge of the general assembly sessions. Because the students do not come in close contact with the team leaders, they usually consider the team members of the small assembly sessions as their major instructors.

Most instructors of audiotutorial courses require attendance at the small assembly sessions, believing these are a valuable experience. The few instructors who do not require attendance report that the number of students coming to them is disappointing, and plan to require attendance when next teaching the course.

INSTRUCTIONAL LABORATORY: PROGRAMMED MODE

The instructional laboratory is the unique feature of the audiotutorial instructional mode. First conceived by Samuel Postlethwait for his botany course at Purdue University, the laboratory consists of individual carrels, each equipped with an audio playback unit. Students enter the instructional laboratory during the day, on an unscheduled basis, and listen to tapes, replaying those portions with thich they have any difficulty. The commentator instructs them at various places in the tape to complete some exercise in their laboratory manuals or to observe one of the exhibits or experiments set up at several different areas in the laboratory. Since the objective is to provide individualized instruction, students are encouraged to spend as much time in the instructional laboratory as needed. Although Postlethwait employed charts and other illustrations in his laboratory, he used the audiotape most extensively.

Similarly, in the League colleges, most instructional laboratories depend heavily on audiotapes to communicate laboratory material to the students. Some have installed expensive playback units in wooden carrels, several labs having as many as eighty carrels. Others have small, portable cassette playback units, which the students usually check out as they enter the laboratory, operating them at various stations throughout the laboratory or at carrels similar to those containing more sophisticated hardware.

Many instructors have prepared 2 x 2 slides to be used in conjunction with the tapes. Although students must advance the slides manually, instructors do not think automatic slide advancement necessarily enhances the process.

Several instructors using the instructional laboratory concept have also employed such hardware as videotape recorders, various kinds of film-loop projectors, and sound-on-slide projectors. This hardware is kept at strategic places in the laboratory; students are directed to use it before beginning the weekly unit or at certain designated points during the course of their work.

In most League colleges, the instructional laboratories are open, permitting students to attend during the hours most convenient to their work schedules. Instructors who assign specific hours for attending the laboratory do so because they either lack the services of a paraprofessional during the weekday hours, or do not have enough stations or carrels to handle the many students likely to be working in the laboratory during the prime hours of the day.

Generally, League instructors rely on paraprofessionals to carry out numerous responsibilities in the laboratory. While all paraprofessionals open and close the laboratory and take charge of the equipment, many, qualified in the course discipline, have also provided instructional assistance for the students. Many also administer quizzes and tests (both written and oral) to students in courses having no separate quiz sessions. The best instructional laboratories are, in fact, those that make extensive use of the unique services of paraprofessionals.

In a few special cases, the costs of instructional laboratories are held down because existing conventional laboratories are converted to open instructional laboratories. In these instances, individual carrels are not constructed, but all the basic characteristics of the more elaborate audiotutorial laboratory are incorporated; e.g., open scheduling, allowing the student to work at his own learning pace, and the use of paraprofessionals for instructional assistance. Some of these laboratories use resulting savings to purchase the various other media needed to equip the laboratory.

Perhaps the most important factor in determining the success or failure of an instructional laboratory is its ability to handle effectively the number of students enrolled in the course. When students must wait even a short time to use the various media, they begin to spend less time in the laboratory than is required if they are to achieve course mastery. If it is to be an effective tool for learning, the instructional laboratory must be as accessible for student use as any library book and as convenient as the student's own course text.

INDEPENDENT QUIZ SESSION

In addition to the general assembly session, the small assembly session, and the instructional laboratory, some of the audiotutorial courses in League colleges contain separate sections devoted to testing students on the material covered earlier in the week. These sections, usually referred to as independent quiz sessions, are usually one hour in length and meet toward the end of the week, usually on Friday. When more than 15 students are to be quizzed, written tests are most commonly used, but when the sessions are limited to very small numbers—perhaps seven or eight—oral tests are also given.

In those audiotutorial courses without separate quiz sessions, students are evaluated either in the instructional laboratory, in the small assembly session, or in the general assembly session. In some instances, instructors use all three for student evaluation: midterm and final examinations are given in the general assembly session; quizzes are reserved for the small assembly session and the instructional laboratory. Although each session can be used effectively for evaluating students, most instructors who do not have the independent quiz sessions find that the small assembly sessions are most suitable for student testing.

INSTRUCTORS' REVIEW SESSION

A few of the audiotutorial courses having a team of instructors devote a special session each week to evaluating the instruction. These sessions are designed only for the instructors; students do not participate. The team members usually meet for one hour and criticize each other's performance in each of the several sessions used in the course. Plans are also made at this time for future work to be covered. In one case, the instructors' meetings were recorded on tape and played the following semester to see if the weaknesses identified during the preceding semester's review sessions had been truly remedied.

GENERAL EVALUATION

Although communicating new trends and techniques is a formidable problem in education, the wide use of audiotutorial courses in League colleges demonstrates that effective communication can be achieved in the community college. In every League district, examples of audiotutorial courses can be found. While the mode is most widely applied to biology, it is also employed by other disciplines such as English and psychology in the academic field and several career programs in the vocational area. Nevertheless, though instructors are trying to broaden the application of the audiotutorial approach, they do encounter certain problems. It may be useful, therefore, to point these out so that instructors planning to teach one of their courses in the audiotutorial mode may be forewarned.

The Use of Programmed Materials

Some instructors attempt to teach under the audiotutorial plan without having sufficient experience in presenting programmed material through different media. Although the approach uses a variety of modes, the most important is the programmed mode, exemplified by the instructional laboratory where the student experiences a totally different approach to learning from either the general or small assembly session. Even in those instructional laboratories that concentrate on the audio rather than the visual medium, the instructor should have some experience in creating programmed audiotapes. Instructors who merely tape-record their traditional lectures are not taking advantage of the pedagogical intent of the instructional laboratory, which is to present programmed material to their students. Unlike lectures that provide a wealth of information in a relatively short period, programmed material on audiotapes is so structured as to present the facts in small, sequential learning steps. At frequent places on the tapes, for example, the commentator should instruct the learner to perform some exercise in his laboratory manual or at one of the stations located in the laboratory. Also, the tape commentator should provide immediate feedback for the learner. While much course material can effectively be communicated to students through lectures, these should be designed for the large group instructional mode or for the general assembly session in the audiotutorial mode. When other media are used—such as slides and film-loops—these, too, must present material that communicates the learning through the program approach and does not merely provide the student with more "lecture-like" information. The instructional laboratory, in short, should be reserved for especially programmed material, if it is to be used as originally intended.

Lack of Funds

Several instructors say that, because of insufficient funds, they cannot revise much of the software material for their instructional laboratories. They readily admit that many of their students' learning problems are a direct result of poorly structured software, but, because their colleges could not provide released time for the needed revisions, the same learning problems perennially confront students in the course.

Administrators should be aware that courses offered under the audiotutorial mode of instruction require more time than conventional courses to reach maximum effectiveness. Without sufficient funds for instructors to improve their learning materials, either released time in the form of a lighter teaching load during the academic year or an extended contract in the summer months, the audiotutorial course will not be as effective as originally planned.

Scheduling Difficulties

In some cases, because of conflicts in scheduling, administrators and instructors schedule general assembly sessions late in the week instead of Monday or Tuesday. This means that students begin their laboratory work not fully comprehending the purpose of each unit. Again, courses should be taught under the audiotutorial mode only if class scheduling permits general assembly sessions to be offered at the beginning of the week and small assembly and quiz sessions at the end of the week.

Audiotutorial Courses for More Students

Most audiotutorial courses offered in League colleges are designed only for nonmajors in a discipline. However, in one or two cases, when instructors have created their audiotutorial courses for majors, they have met with much success. If the rationale behind the audiotutorial mode is to expose learners to different approaches to learning, and not merely to handle large numbers of students, it is evident that majors can benefit as much as nonmajors from it. Offering courses under this mode for majors may mean having a traditional laboratory in addition to the instructional laboratory, if the instructor feels that the former can provide the needed supervision so necessary in conducting complex experiments. However, inclusion of the traditional laboratory does not invalidate the audiotutorial mode; it only makes more extensive use of the conventional approach.

The Self-Directed Student

Not all learners can benefit from the audiotutorial mode. Self-directed learners seem to be quite successful, but those who need the prodding of an instructor to complete course requirements usually receive incompletes under this approach. Since students must spend so much time in the instructional laboratory, only those who are disciplined enough to work there on their own initiative until they have mastered the learning materials function successfully in the audiotutorial course. Therefore, whenever possible, students should have the option of taking any required course under *either* the audiotutorial *or* the conventional mode. If it is not possible to offer a course under both modes, the instructor of the audiotutorial course should use the opening weeks of the semester as a transitional period between the conventional mode, to which students have been accustomed at the secondary level, and the audiotutorial mode—slowly preparing them to work on their individual schedules and at their own pace in the instructional laboratory.

THE COST OF AUDIOTUTORIAL COURSES

In most cases, audiotutorial courses have a higher per-pupil cost than the conventionally organized (see Table V-1). Courses under the audiotutorial mode included in this study have a range of direct instructional cost from a low of $15.65 to a high of $303.96 per student. The mean cost is $83.08 on a per-student basis (not including the four courses from Brookdale Community College, since they have no matching conventional courses). On the other hand, the conventional courses have a range of direct instructional cost from a low of $18.17 to a high of $339.77 per student. The mean cost for this group of courses is $81.31 on a per-student basis.

TABLE V-1

A COMPARISON OF DIRECT INSTRUCTIONAL COSTS BETWEEN COURSES UNDER THE AUDIOTUTORIAL AND THE CONVENTIONAL MODES OF INSTRUCTION

Name of Course	District Where Course Is Given	Audiotutorial Cost per Pupil	Conventional Cost per Pupil
Algebra, Intermediate 013	Dallas County Community College District	$ 21.60	$ 42.96
Anatomy and Physiology	Central Piedmont Community College	49.93	29.33
Anthropology, Introduction	Santa Fe Junior College	15.65	20.04
Biological Concepts 110	Maricopa County Community College District	104.50	54.64
Biology 1	Los Angeles Community College District	76.78	49.93
Biology 1A	Los Rios Community College District	194.48	159.13
Biology II	Coast Community College District	56.35	N. A.
Biology 112	Brookdale Community College	81.73	N. A.
Biology 115	Dallas County Community College District	41.29	46.20
Biology 115 and 101	Dallas County Community College District	41.31	102.48
Chemistry 51	Los Rios Community College District	113.58	127.35
Chemistry, General College	Junior College District of St. Louis	76.28	76.78
Economics 102	Brookdale Community College	46.32	N.A.
Electronics 230	Brookdale Community College	100.11	N.A.
English A-B	Coast Community College District	16.58	29.83
Humanities 1	Los Rios Community College District	41.43	30.57
Mathematics 115	Maricopa County Community College District	70.81	54.12
Nursing 111	Delta College	303.96	339.77
Psychology 1A	Foothill Community College District	16.57	18.17

With a few exceptions, enrollments in audiotutorial courses are not high enough to offset the added costs of the sophisticated equipment used in the instructional laboratories. Such equipment as audio playback units, slide projectors, individual learning booths (carrels), and the software adds substantially to the total instructional costs of audiotutorial courses. Most of the League colleges also give their respective instructors some additional stipend for reorganizing the conventional course into one for the audiotutorial instructional mode. Sometimes these stipends are given for labor preparation over the summer months and sometimes in the form of lighter teaching loads during the academic year. These moneys increase still more the total instructional cost of the audiotutorial courses.

The student enrollments in audiotutorial courses in the League colleges surveyed are probably not high enough to compensate for the added costs of labor preparation and equipment purchases—even though the costs are amortized over varying periods. In most cases, however, the audiotutorial courses are relatively new (none more than two years since first offering) and, as a consequence, the enrollments have not yet reached their optimum levels. In fact, all of the League instructors of audiotutorial courses specify that they can handle a substantial increase in students and not decrease their instructional effectiveness. Therefore, one can say with some degree of certainty that audiotutorial courses will have a lower per-pupil cost than courses under the conventional mode, when they reach their optimum level of student enrollment (see Appendix C).

THE EFFECTIVENESS OF AUDIOTUTORIAL COURSES

No consistent pattern exists between audiotutorial and conventionally organized courses in effectiveness as demonstrated by objective data (see Table V-2). In some cases, audiotutorial courses have both a higher grade distribution and a higher student completion record than courses under the conventional mode, but in other cases, the reverse is true. Therefore, using only the objective data collected, we see no apparent difference in the effectiveness of the two approaches to classroom organization.

Judging by the subjective data, however, collected through instructor interviews, there appears to be a major difference between courses under the two instructional modes. Instructors consistently report that, in their professional opinion, students are better trained in courses under the audiotutorial mode than were their former students under the conventional mode. League instructors also perceive their students as enjoying learning under the audiotutorial mode—much more so than past students in conventional classes. They believe their students appreciate being able to work through much of the instructional material at their own pace and enjoy the multimedia approach used in the instructional laboratory. The instructors also believe that, given a short time, they will improve their instructional material significantly, thereby creating courses that will indeed be more effective for more students than their former conventional courses, which depended solely on a standard textbook used in a self-contained classroom.

TABLE V-2

A COMPARISON OF LEARNING OUTCOMES BETWEEN COURSES UNDER THE AUDIOTUTORIAL AND THE CONVENTIONAL MODES OF INSTRUCTION

Name of Course	District Where Course Is Given	Audiotutorial		Conventional	
		Percentage of Students Completing the Course	Student Grades (Weighted Index)	Percentage of Students Completing the Course	Student Grades (Weighted Index)
Algebra, Intermediate 013	Dallas County Community College District	19.23	.48	33.33	.79
Anatomy and Physiology	Central Piedmont Community College	93.55	2.75	96.63	2.90
Anthropology, Introduction	Santa Fe Junior College	83.33	2.65	66.87	1.96
Biological Concepts 110	Maricopa County Junior College District	55.36	1.71	80.34	2.73
Biology 1	Los Angeles Community College District	87.86	2.39	56.67	1.42
Biology 1A	Los Rios Community College District	80.19	2.35	85.45	2.45
Biology II	Coast Community College District	78.95	1.98	N.A.	N.A.
Biology 112	Brookdale Community College	48.89	1.07	N.A.	N.A.
Biology 115	Dallas County Community College District	62.38	1.47	60.31	1.27
Biology 115 and 101	Dallas County Community College District	73.51	1.85	85.61	1.70
Chemistry 51	Los Rios Community College District	42.11	1.00	45.16	1.06
Chemistry, General College	Junior College District of St. Louis	85.51	2.52	72.38	1.57
Economics 102	Brookdale Community College	47.06	1.32	N.A.	N.A.
Electronics 230	Brookdale Community College	77.78	2.56	N.A.	N.A.
English A-B	Coast Community College District	48.03	1.20	60.87	1.30
Humanities 1	Los Rios Community College District	86.26	2.29	95.53	2.87
Mathematics 115	Maricopa County Junior College District	N.A.	N.A.	N.A.	N.A.
Nursing 111	Delta College	69.31	1.89	90.32	2.06
Psychology 1A	Foothill Community College District	51.00	1.77	82.47	2.19

Following are descriptions of the audiotutorial courses included in this report. The information on them was gathered by interviewing League instructors currently teaching these courses. Each narrative discusses the procedures students follow in the course and the instructor's subjective evaluation of them. From these descriptions, it is evident that League instructors are enthusiastic about their courses and are optimistic that the audiotutorial instructional mode will be a more effective approach to teaching their respective disciplines than the conventional mode of instruction.

Algebra 013, Intermediate: Fall 1971

Mountain View College

(Dallas County Community College District)

Intermediate Algebra uses two contrasting modes of instruction to teach algebra to freshmen. During registration, students first enrolling are programmed into the conventional mode of instruction. This section meets for three one-hour sessions in a self-contained classroom, where the lecture approach is used. Students registering later find that the only section of intermediate algebra open is the one that uses the audiotutorial mode of instruction. Both the administrators and the course instructor believe that this registration procedure contributes in large part to the high attrition rate of the audiotuturial section.

The audiotutorial mode requires students to meet one hour a week in a general assembly section, held every Friday after they have completed the week's assignment. These sessions are devoted to short tests and to discussions of any material the students find difficult to understand. The instructor states that the students enjoy these sessions because they have contact with the instructor and, unlike the audiotape, can ask him questions. Because the registrar's office requires it, roll is taken in these sessions.

Small assembly sessions are held each week in two half-hour meetings, devoted to solving difficult problems in the laboratory manuals that students cannot do alone. The course instructor believes that these sessions are more effective for self-directed learners, since the less disciplined students rarely attend.

The audiotutorial mode requires students to spend at least two hours per week listening to the audiotapes set up at carrels located near the mathematics offices. The tapes, purchased from a commercial publisher, are designed for use with a programmed laboratory manual. While students can spend as much time listening to the tapes as they wish, the laboratory is forced-paced, not self-paced, since weekly quizzes are given in the one-hour general assembly sessions. According to the instructor, many of the better students complain that the audiotapes are superfluous and, in consequence, use the laboratory manual as the major source of information.

The instructor also states that students need contact with a teacher. In revising the audiotutorial intermediate algebra section for the following semester, therefore, he will ensure that students have direct contact with an instructor and spend more regulated hours in the laboratory. He feels that these revisions are justified because only a small percentage of students successfully complete the course under the audiotutorial mode. On the other hand, the students in the conventional mode indicate on the college attitudinal survey that they enjoy learning in the course.

The instructor believes that the audiotutorial mode of instruction is more effective for the nonmajor in a subject than for the major. Majors should have extensive contact with their instructors, a demand not usually satisfied under the audiotutorial mode. It can be effective for nonmajors if some contact with the instructor is combined with individual laboratory work.

ANATOMY AND PHYSIOLOGY: FALL 1971

Central Piedmont Community College

Anatomy and Physiology, an eleven-week course designed for students majoring in the health-related occupations, uses an audiotutorial instructional mode with certain modifications. Students are required to attend three one-hour lectures each week. Except for more extensive use of films and slides, these lectures are identical to the ones given in the course as taught under the conventional mode—last offered in the fall of 1969. Unlike the general assembly sessions of most courses using the audiotutorial mode, these lectures communicate course content in physiology and are not limited to motivating students to the coming week's material.

Because not enough instructors are available, small assembly sessions are not used, but students have the opportunity to ask questions of the instructor in the general assembly sessions. Any individual problems that arise from these questions are handled later when the student and instructor meet in the laboratory.

While the course under the conventional mode utilized a traditional laboratory, which students were required to attend four hours per week (two blocks of two-hour sessions), the course under the audiotutorial mode uses an open laboratory. Without spending large amounts of money to create a carrel at each station, tape recorders are purchased and placed at each of the 20 student stations and earphones are provided with each tape recorder. Students, coming into the laboratory at any hour that suits their daily schedule, listen to the instructor-prepared tapes while working along with the laboratory manual (also prepared by the instructor) and their course textbook. The material in the laboratory is primarily devoted to the study of anatomy.

A paraprofessional operates the open laboratory during the day, thus allowing students to work there at almost any hour they wish to come. (The instructor has collected attendance data and reports that the average student is spending about three and a half hours a week in the laboratory.) Besides opening and closing the laboratory, the paraprofessional provides instructional assistance and administers weekly quizzes to students, which are usually taken on Friday.

The instructor reported that most students enjoy learning under the audiotutorial mode of instruction. They especially appreciate being able to work at their own pace of learning (although they are required to finish the laboratory assignment by the end of the week). The students also enjoy the flexibility of scheduling.

Because of the successful experiences his students have under the audiotutorial mode, the instructor highly recommends its use for other areas in the science department. Except for areas where there might be some danger from students working independently with chemicals or micro-organisms, the instructor believes that the audiotutorial instructional mode provides a sound approach to teaching.

ANTHROPOLOGY, INTRODUCTION TO: FALL 1971

Santa Fe Junior College

Introduction to Anthropology is a six-hour course designed to expose students to the principles of both physical and cultural anthropology and linguistics. It uses an audiotutorial mode of instruction. As the instructor explains to his students, this mode "seeks to give the student access to the widest possible range of learning situations, while emphasizing a general sense of freedom on the part of the student to pursue interest areas of his own choice, control the pace for his own learning, and choose the times for learning that best suit his daily schedule."

Students meet each Monday for a general assembly session, which lasts for approximately two hours and introduces them to the coming week's material. Since these weekly sessions are motivating in design, less time is given to conveying course facts than in most traditional lectures. Four of the sessions are used to show films and one is reserved for a guest anthropologist.

At any time during the week, but prior to the small assembly sessions referred to as "pit sessions," the students are instructed to listen to the tapes that are kept at a number of carrels located near the instructor's office. The headphones, take-up reels, and tapes themselves are obtained from the department secretary. The tapes last for approximately two hours, and students are encouraged to listen again to any portion they find confusing. Since the instructor's office is located next to the carrels, students can usually receive instructional assistance from him.

The tapes vary in their content, but the instructor, who is the commentator, does not feel that he has to attain professional audio quality. In fact, he stated that the most effective tapes are those recorded in such familiar environments as his home. He finds that students do not mind even when such extraneous noises as his dogs barking are recorded. He also tells jokes and makes humorous remarks on the tapes. In short, he "raps" with the student and does not lecture to him.

Before coming to the pit sessions, students are also required to complete the weekly required readings in the library. Chapters are assigned from several monographs and students are asked to make their own selections from an extensive list of suggested readings. They are instructed to write on a 3 x 5 card the key concept from these suggested readings and be prepared to discuss it at the weekly pit sessions.

Each pit session is limited to about twelve students, who meet in a small encounter-like room. Each student is given the opportunity of sharing the key concept of the work he has read. The instructor tries to create an informal atmosphere in these sessions, even though the students are evaluated each week on how they discuss their key concept and on their general participation. Many times the students become so involved in the discussions that they last over two and one-half hours, although they are scheduled to last only an hour and fifteen minutes.

Besides evaluating the students' performance in the pit sessions, the instructor provides an ethnographic exercise and a take-home examination. He feels that his students are satisfied with this method of evaluation, especially the weekly evaluation from the pit sessions.

The instructor stated that he has begun to use the audiotutorial mode because it opens up other approaches to learning. He feels that the course, under the conventional mode, relied too heavily on the lecture approach (three weekly one-hour sessions), but he added that tapes can be as ineffective as lectures if the instructors lack imagination and creativity. In fact, he hopes to include other media in the course to provide his students with as many avenues as possible for learning. He feels that the course offering in the 1971 fall quarter represents only an interim period and, given the time, he will strive to create an entire anthropologic learning center for his students, equipped with learning carrels with audiotapes, slide projectors, closed-circuit television, working laboratory models, and dial access.

BIOLOGICAL CONCEPTS 110: FALL 1971

Scottsdale Community College
(Maricopa County Community College District)

Biological Concepts 110 uses the audiotutorial mode of instruction to teach basic concepts to both majors and nonmajors in biology. Guided by an instructor, students are allowed to progress at their own learning pace. "By allowing students to pursue specified objectives at their own rate of speed, students are able to complete assigned work ahead of schedule if motivated to do so," explained Larry Stevens, a former biology instructor and now associate dean of the college.

The students meet each week for one hour in a general assembly session where they are given tests on the preceding week's material. The tests last for about 30 minutes and the remaining time is devoted to a film or lecture on the coming week's material.

The students under this mode also meet one hour each week in a small assembly session. In these seminar-like sessions, students have a chance to discuss the preceding week's work.

They spend four hours a week in the instructional laboratory, which is open from 8:00 a.m. to 8:00 p.m., five days a week. In the laboratory, they are given the appropriate week's tapes and a small inexpensive player. With the aid of an outline prepared by the instructor, they proceed at their own pace to complete the tasks assigned for that week's laboratory session. A paraprofessional, highly knowledgeable in biology, is present to offer assistance. "With this approach," said one administrator, "we can begin moving students through curriculums and courses based upon the individual's ability and talent. Eventually, we hope to allow more capable students an opportunity of finishing the semester course in a month's time."

Under the conventional mode of instruction, students meet each week for three hours of lecture and three hours of laboratory work. All students are expected to finish the prescribed assignments in a specified amount of time. There are no paraprofessionals to assist the instructor during the semester course.

The instructor estimated that, in organizing both the audiotutorial and conventional modes of instruction, he spent almost 13 hours per day. He feels that released time is necessary to prepare the learning packages for the audiotutorial course and for organizing all *new* courses, regardless of the instructional mode.

The instructor believes that both majors and nonmajors can benefit from the self-pacing course. "A major will do well in the A-T approach because he is already motivated in the subject matter. However, nonmajors have the option of spending additional time in the laboratory, whereas all students in the conventional course must work at the same rate."

Biology I: Spring 1971

Los Angeles Valley College
(Los Angeles Community College District)

Biology I is a semester course for nonscience majors. The course content, especially designed for such students, differs from what the science major receives only in emphasis. The chief purpose of the course is to make the students aware of and sensitive to their biological environment. Its three specified objectives are: (1) to develop literacy in the basic concepts of modern biology for the nonscience major; (2) to provide the most active involvement of the student with the objects of biology; and (3) to make allowance for individual differences in interest and ability.

The course uses an audiotutorial mode of instruction. Each week students spend three one-hour sessions in a general assembly session devoted to lectures similar to those given in a conventional biology course. The instructor states, however, that his lectures have slowly been adapted to meet the new form of the course as organized under the audiotutorial mode; i.e., they have grown shorter and thus more compatible with the capabilities of nonscience majors. Roll is taken in these general assembly sessions.

While the course has no small assembly sessions, the instructor requires the students to spend one hour each week in the instructional laboratory. Each student is provided with a "Bio-Tutorial Study Guide," which contains numerous units, one for each week of the laboratory work. (Each unit contains a set of behavioral objectives and the accompanying learning activities.) Students listen to tapes that instruct them to complete items on their study sheets and to participate actively in specific laboratory experiments. Paraprofessionals or laboratory assistants are available for individual instruction for any student who requests it. In the laboratory, students also are administered a short quiz on the preceding week's laboratory work. On leaving the instructional laboratory, students will first turn in both the weekly quiz and their respective unit's study sheets (which are returned to them in the general assembly sessions) and then have their time verified by one of the laboratory assistants. The instructor learned from these time cards that most students are spending more than the one hour required each week in the laboratory.

The instructor is enthusiastic about his course as taught under the audiotutorial instructional mode. He said that students have shown on a course evaluation questionnaire that they thoroughly enjoy the course under this approach. He gave several reasons for their positive attitude: (1) this mode allows the development of an informal atmosphere; (2) students are provided with individual instruction by the laboratory assistants; and (3) they are allowed to participate fully in the laboratory experiments.

The instructor feels that both majors and nonmajors can benefit from this course, although he has not yet had the chance to organize his zoology course for majors under this multimedia approach. He is so enthusiastic about the audiotutorial mode that he feels all courses should be taught in this way, but, because he believes that paraprofessionals or instructional assistants are perhaps the single most important variable under this mode of instruction, he thinks it should be referred to as the "tutorial mode of instruction."

In Biology I, under the conventional mode of instruction, students meet for three one-hour lecture sessions, just as they do under the audiotutorial mode. In addition to the three hours of lecture, they must spend one hour per week in a demonstration session. During each session, the instructor demonstrates some biologically related experiment, and the students then replicate it with the help of their laboratory manual. Students are required to finish their demonstration assignment by the end of the class period. The course under this mode does not use any paraprofessionals for instruction.

The department chairman, who formerly taught the course, said that the conventional mode is effective, since most students enroll in the second semester biology course. While he admits that the instructional laboratory of the audiotutorial course is more flexible than the demonstration sessions under the conventional mode, he feels that students very much enjoy learning in the latter environment. Further, he stated, the conventional mode can also be an efficient and economical way to instruct college students.

BIOLOGY 1A: FALL 1971

American River College
(Los Rios Community College District)

Biology 1A is an introductory course for students who have selected biology as their major. Two instructors adapted the conventional course, last given in the fall semester of 1970, to an audiotutorial instructional mode.

The conventional mode required students to attend three hours of lecture per week and six hours of laboratory work; the audiotutorial mode allows the students greater flexibility, especially in their laboratory work. They meet twice a week in a general assembly session, usually devoted to lectures similar to those delivered under the conventional mode, but better integrated with the laboratory work. At times guest speakers are invited to these large group sessions and 16mm films of appropriate subjects are shown. The instructors in delivering these lectures attempt to motivate the student toward the coming week's work.

While the students under the audiotutorial mode are assigned specific hours in the laboratory, they are allowed to work there any time it is available. Students use the behavioral objectives and laboratory instructions that have been distributed to them on Friday in their quiz sessions. In addition to studying their textbook and supplementary readings, students view slides and listen to tapes. A full-time instructor is always available (and, in the afternoons, a paraprofessional) to answer their questions. The paraprofessional is also responsible for setting up the laboratory work each week. Students are required to complete the laboratory assignment by the end of each week.

Every Friday students meet in groups of sixteen for quizzes. During these small group sessions, students are administered both an oral and a written test. They are also given a unit test every three or four weeks and a comprehensive final at the end of the semester. They are not, however, allowed to take alternate forms of the test if they have scored poorly on the original one. One of the instructors states that he has not had the time to prepare the alternate forms, since the originals require such a long time to assemble.

The two instructors estimate that they spent one entire summer organizing the course and approximately ten hours per week revising and preparing additional material while the course was in progress. While the audiotutorial mode of instruction requires much more time for preparing material than the conventional mode, the instructors feel that their audiotutorial students are better prepared for university work than those who have taken only the conventional course. In fact, many students reporting back to the instructors, after enrolling in biology courses at the University of California at Davis, testify that they have indeed been well prepared in the basic knowledge and skills of biology.

Even though the audiotutorial teaching *schedule* is no more flexible than the conventional, the instructors feel that the *course* is much more flexible for the students, for they can attend the laboratory at any hour convenient for them. In fact, to discover the hours students most prefer to work in the laboratory, the instructors asked them to sign in and out of the laboratory. This information is used both to improve the efficiency of the laboratory and to counsel students doing unsatisfactorily in the course.

The two instructors emphasized that in their opinion audiotutorial instructional modes can be adapted for both majors and nonmajors in a discipline. One of them states that too many audiotutorial courses are designed solely for nonmajors because colleges are more interested in procedures for handling a great number of students than in focusing their attention and resources on improving instruction. Both instructors are proud that their biology course is one of the few examples in the country of an audiotutorial instructional mode designed especially for majors. They make this assertion from having spent considerable time in visiting prototypes of audiotutorial courses at all levels of education across the United States. From their observations, they incorporate in Biology 1A the best methods currently used in courses under the audiotutorial mode of instruction.

BIOLOGY II: SPRING 1971

Golden West Community College
(Coast Community College District)

Biology II, a survey course for nonscience majors, is intended to satisfy, in part, the general education requirement of the college. The students meet for one hour per week in a general assembly session. This one-hour session is designed to be inspirational rather than fact-finding—though concepts the instructors feel should be taught in large groups are covered. In addition, weekly student evaluation is undertaken in the general assembly sessions.

A small assembly section of 20-25 students is held every week for small group discussions to clarify any problems that occur in the material from the preceding week.

For three hours per week, students work in an instructional laboratory that allows them to progress through the week's material at their own rate of learning. A paraprofessional biologist with an M.A. and a credential in biology is always on hand to assist the students. In addition, staff biologists are present in the laboratory for 25-30 hours per week to give individual help. The laboratory is open for 37 hours each week.

On entering the laboratory, students pick up a set of mimeographed instructions with the objectives to be met for the week—they are always stated in behavioral terms. In these independent study sessions, students move from one station to the next until they have completed the laboratory work. Each station attempts to use a different medium. For example, at one station students may view a series of slides on the human skeleton; at the next station, they may review the parts of the human anatomy by working on a model skeleton. By giving students these several different experiences, the instructors hope to reinforce concepts in their minds.

Experiments, demonstrations, reference materials, and audiotapes are also available to all students for reviewing past weeks' material. The laboratory, at present, can maintain the complete set-ups from three separate weeks of work.

Biology II, as taught through the conventional method, met in small assembly sessions, each with an enrollment of 30 students. Students met each week for three hours of lecture and two hours of laboratory work. Under the audiotutorial approach, students are given much more flexibility in choosing when they want to attend the laboratory. In addition, the instructional laboratory provides them with a number of teaching methods, each chosen because it facilitates the teaching of some particular concept. At present, a problem of logistics prevents students from completing the course before the end of the semester, but the instructors hope this problem can soon be remedied.

Subjective data on student attitudes toward the new approach to teaching Biology II indicate that this innovative method is quite successful. Except for some students who object to being organized into general assembly sessions, they seem satisfied and tend to enjoy learning under this new system.

BIOLOGY 112: FALL 1971

Brookdale Community College

Biology 112 consists of 36 units in basic anatomy and physiology. It is designed mainly for students enrolled in the nursing programs and in the medical-related fields. Most of them enroll during the second semester of their college education.

The course uses the audiotutorial mode of instruction in combination with the more conventionally organized science laboratory. Each week the students meet in two large and one small assembly sessions. Course lectures are given in the large group sessions, and discussions based on the lecture and reading materials in the small group sessions. In addition to these two types of session, students meet three hours each week in a traditional laboratory where, unlike most laboratory settings under the audiotutorial method, the students are assigned specific times to work. They can, however, leave the laboratory as soon as their assignments are completed. Students who want to complete additional course objectives to receive either "credit with honors" or "credit with high honors" use learning packages, consisting of tapes and synchronized sets of slides, in the Learning Resource Center.

The instructor, who has taught the course for seven semesters, estimated that the organization of the course (including the preparation of the learning materials) took about 400 hours. In addition, he spent about 30 hours a week revising existing materials and preparing new ones. He believes that released time would not be the best procedure for encouraging instructors to revise materials; he feels that fewer student contact hours would be more effective.

The instructor has decided to reorganize the course completely in the audiotutorial mode of instruction, even though he believes that traditionally organized laboratories have the distinct advantage of allowing the instructor to conduct and demonstrate experiments, since, unlike instructional laboratories, the students report to class at a specified time.

BIOLOGY 115: FALL 1971
El Centro College
(Dallas County Community College District)

Biology 115 uses an audiotutorial mode of instruction for teaching the beginning principles of biology to freshmen. One full-time instructor with a master's degree and one paraprofessional with a bachelor's degree, both in biology, are responsible for more than 300 students.

Under the conventional instructional mode, the course had three hours of lectures and three hours of a traditional laboratory. The lectures made no allowances for individual differences. The laboratory was not effective, because most students did not participate directly in the experiments. Since the students were divided into small groups of four, only one of the students could conduct the experiment; the other three merely observed. In addition, the students could remain in the laboratory no more than the three hours of allotted time. In short, the laboratory did not allow for individualized instruction.

Under the audiotutorial mode, students meet at the beginning of each week for a one-hour general assembly session, whose purpose is to prepare the students for the coming week's work. Many times interesting films are shown and occasionally a speaker is invited to talk on some topic of interest. At the end of each session, a short quiz is administered on the preceding week's material.

There are usually six to ten small assembly sessions each week. During some weeks, the instructor does not schedule any of these small-group sessions because he feels that the laboratory work during those weeks does not warrant any discussion. Although these sessions are always voluntary on the part of the students, the instructor notes that, as the semester progresses, attendance increases greatly. Students comment that they evaluate the sessions as effective because they help them interpret which instructional material is really important in the unit.

Since the instructional laboratory is the major source of learning, the students consequently spend most of their time proceeding through the self-pacing materials. They listen to audiotapes at individual carrels and, when told to do so by the tape commentator, go to one of the laboratory demonstrations to perform some activity. At each carrel, charts also provide the visual experience so necessary to learners. Students can listen to the tape lectures as many times as they wish and, if necessary, stop the tape, reverse it, and listen to sentences they missed in taking notes. After they have completed the laboratory material, they can use a series of slides in the visual room to review all the important concepts covered for each week's laboratory session.

The instructor stated that the laboratory is effective because it allows each student to progress at his own rate of learning. He does not have to compete with his peers nor be afraid to ask questions. Interestingly, the paraprofessional who spends his time in the laboratory was hired, in part, because of his youthful appearance. The rationale was that students would feel comfortable when coming to him for help and it has proved to be the case. Of course, students must complete the laboratory before the end of the week, since a test is given each Monday in the general assembly session on the previous week's work. Students who finish the laboratory work earlier in the week can review for the coming quiz by attending one of the small assembly sessions scheduled late in the week.

A study has been conducted on the length of time each student is spending weekly in the laboratory. These data were easily obtained because students are required to clock in and out of the laboratory. (The time card is also used by the student to reserve a carrel.) The study shows that a student working at the "A" level is spending four hours per week in the laboratory. This information is used by the instructor to counsel students who are not doing well in the course; no minimum time requirement in the laboratory is established.

The instructor recommends the use of the audiotutorial mode of instruction for every area of science except organic chemistry, but feels that not all instructors are suited for this instructional mode. Before he can be successful in this approach, the instructor must understand the value of different media and be willing to spend many extra hours each week preparing and revising instructional materials. (This instructor stated that in this capacity he spends approximately 20 hours per week.) Because the purpose of the audiotutorial approach is to treat each one as unique, "the instructor has to have a very sympathetic attitude toward the student."

BIOLOGY 115-101: 1970-71
Eastfield Community College
(Dallas County Community College District)

Biology 115 is designed for nonmajors in biology. Its ultimate goal is to develop students who are scientifically literate in the principles and fundamentals of biology. The course is structured on the audiotutorial mode to provide effective instruction for large numbers of students.

Each Monday, students meet for one hour in a general assembly session devoted to general announcements and interesting films. The instructor finds his general sessions successful in communicating effectively to many students enrolled in the course. Students can also be administered a short written quiz on the preceding week's work in the laboratory. The student can elect not to take the written quiz, with no penalty attached, if he feels he has not yet completed last week's laboratory assignment.

The instructor is responsible for approximately twelve small assembly sessions each week, the number depending on the instructional material being covered. Since these small group sessions (15 to 20 students) are voluntary, students who feel they do not need to spend any time in a question-and-answer session do not come. Other weeks, the instructor finds that the small sessions each have more than 20 students attending because that week's instructional material is unusually challenging. The small assembly sessions are usually scheduled from Wednesday through Friday.

The instructional laboratory, as is usual under the audiotutorial mode, allows the students to spend as much time as they wish on their laboratory assignment. They work at individual carrels, where they listen to tapes prepared by the course instructors. During the tape narration, for example, students will be told to peruse the demonstration in some section of the laboratory or to watch one of the film-loops. Whenever students have completed the week's required assignment, they are administered a short oral quiz by the laboratory paraprofessional, who is responsible also for answering student questions on either the instructional material or the equipment itself. These five-minute oral quizzes can, if the student desires, be taken either in a small assembly session or with an instructor during his office hours. (Those who do not take the written quiz in the general assembly session will earn whatever grade they receive on the quiz. Those who take both the written and the oral quizzes will earn the higher grade.)

Although students are not required to spend a minimum amount of time in the instructional laboratory, they do clock in and out. The course instructors at the end of each semester study the correlation between the students' grades and the time spent in the laboratory. They use this information to evaluate the course, not the students.

The instructors meet each Friday in an instructor review session for one hour. At these weekly sessions the material covered during the past week is evaluated in terms of the established behavioral objectives. The sessions are recorded on audiotapes and used the following year when one of the instructors is assigned responsibility for that unit of work. By listening to these evaluative tapes, the instructor has a good opportunity to improve the instructional materials for that unit.

Although the attrition rate is relatively small for these nonmajors, the instructor said that some students dislike the course. In fact, to give students a chance to voice their criticism of the course, a suggestion box is placed in the laboratory; it receives extensive use. The instructors take the time to answer in writing each criticism placed in the suggestion box.

The course instructors feel that released time is necessary to improve the audiotapes, the printed scripts, and the working of the behavioral objectives. One instructor found that he spent at least 40 hours a week planning and preparing the instructional materials and that he and his colleagues are seriously considering converting the entire science area to the audiotutorial mode. He also mentioned that not all instructors are suited for this approach. Specifically, an instructor can succeed in teaching courses under this mode only if he is "student-oriented."

Biology 101, also taught at Eastfield Community College during the academic year 1970-71, is designed for science majors. The one-year course provides a firm base for further scientific endeavor. To provide more attention for each student, the course uses a self-contained three-hour laboratory and three one-hour lecture sessions. As in most conventional science courses, students work in teams of two to four members on the laboratory experiments. Also, as is usually the case, while there is no specified time requirement in the laboratory, students usually find that they need three hours of class to finish the laboratory assignment.

The instructor stated that students enjoy learning under this conventional mode of instruction. While he plans to make some changes in his approach to it, he does not want to use the audiotutorial instructional mode, as in Biology 115. He very much appreciates that the multimedia approach is an integral part of this mode and hopes to incorporate some of them into his conventional mode. He feels, however, that majors in biology need individual attention, which he believes is not provided in the audiotutorial mode. Ideally, the instructor hopes to use a modified audiotutorial approach, incorporating many media, but perhaps restricting the enrollment to small groups of students. In short, he is looking for an effective instructional mode that will allow him intimate contact with his students.

CHEMISTRY 51: FALL 1971
Sacramento City College
(Los Rios Community College District)

Chemistry 51, a one-semester course designed to prepare freshmen for the college-credit Chemistry 1A course, uses an audiotutorial instructional mode, although students do not meet in any small assembly sessions.

For one hour each Wednesday, students meet in a general assembly session devoted to a range of instructional activities from traditional lectures to films and guest speakers. The sessions are voluntary for the students, and none of the material covered is included on the course tests. The instructor stated that most of the students attend these sessions, depending, of course, on how interested they are in the material being covered during any particular week.

As usual under the audiotutorial instructional mode, students are able to work through their laboratory assignments at their own pace, but they are assigned laboratory hours for their experiments, since there is no paraprofessional in the laboratory during additional daytime hours.

Sound film-loops are the instructional medium in the laboratory experiments. After students have viewed the appropriate film, they conduct the identical experiment using a known chemical. After arriving at the correct answer, they ask the instructor for the unknown chemical. The student, after completing the experiment, then checks his answer with the instructor. If it is correct, he is permitted to proceed to the next laboratory assignment. If it is incorrect, he is instructed to redo the experiment until he arrives at the correct answer.

Besides the laboratory session, students must spend extra hours each week in the Learning Resource Center, where they work through programmed printed materials from commercial publishers. When students finish a unit, they ask the clerk for a unit quiz. All those scoring below 70 percent are directed back to the unit for additional work and retested, using the same form of the test. The students, few as they are, who again score below the 70 percent level, are told to see the instructor for private tutoring.

The conventional course in Chemistry 51 required students to listen to three hours of lecture each week and do two hours of laboratory work per week. The laboratory was traditional, the students all worked on the same experiment, and they were forced to finish in the allotted laboratory hours.

During the interview, the instructor stated that he spent over 300 hours reorganizing the course under the audiotutorial instructional mode. Most of the time was spent preparing the many sound film-loops for the laboratory portion of the course. In contrast, he spent only 90 hours organizing the lectures for the course as given under the conventional mode of instruction.

The instructor enthusiastically recommended the audiotutorial mode for other disciplines and other chemistry courses, but specified that this particular mode is perhaps better adapted for nonmajors or for slower learners. He feels that programmed materials are possibly too repetitious by design for "shrewd" learners. He also believes that the audiotutorial mode is better for teaching manual skills than conceptual skills, and therefore recommends its application in the vocational-technical disciplines. "All types of learners, regardless of their ability, will benefit from the audiotutorial instructional mode when learning in this area of manual skill."

General College Chemistry: Fall 1971

Meramec Community College
(Junior College District of St. Louis)

General College Chemistry employs the audiotutorial mode of instruction. Students meet at the beginning of the week for a one-hour general assembly session, designed to present motivating lectures on various topics, many of them not part of the regular course content. Students may or may not attend these sessions, depending on how interested they are in the particular topic.

In the middle of the week, another general assembly session is held; 75 percent of the time, films are shown. Although these sessions are optional, the films cover topics that are part of the regular course content.

Students spend one hour per week in small assembly sessions where they can discuss any of the regular course material covered in the unit being studied. These sessions are required later in the semester only for students who have received a grade of "C" or lower for their midterm grade.

Students spend as much time as they wish in the instructional laboratory. They proceed through the required course content and laboratory work by listening to audiotapes and reading the same material in the form of written "Discussions." These units are semi-programmed, so that the students must participate actively by recording answers to questions in another book called the "Student Response Book."

At the end of the week, students attend a final general assembly session where they are given a 40-minute quiz on the instructional materials. Those who score at the 70 percent level do not have to take an alternate form of the test the following week, unless they want to raise their grade. If they so choose, the grade scored on the make-up test becomes the recorded grade for that unit's work. Students who score below the 70 percent level are required to take the make-up test. The grade on this test then becomes their recorded grade for the unit's work.

The course, under the conventional mode of instruction, required students to attend three hours of lecture per week in a large group meeting. Some semesters one of the hours was used to allow students to regroup themselves into small discussion groups. They were also required to attend a traditional laboratory in which they could spend up to three hours working on the week's experiments. As the materials were not programmed, the instructor conducted the laboratory in lock-step. Students who completed the laboratory work in less than three hours could leave, but it was difficult for students to spend any more time in the laboratory than the allotted three hours.

The instructor stated that the audiotutorial instructional mode is preferable to the conventional mode because it not only allows students to teach themselves but also allows the instructor to work with them individually. While the course is forced-paced rather than self-paced (since the work must be completed during the semester), it still allows the student to experience learning without being in a formal, self-contained classroom.

The instructor of the course is somewhat disappointed in usual laboratory work. He feels that, ideally, a laboratory should allow students to work on *individual* experiments that meet their particular needs. In the laboratory under the audiotutorial mode of instruction, while students can within certain limits work at their own pace by spending as many hours as they need each week, they are all, in effect, working on the same experiments. In the future, the instructor hopes to remedy this situation.

ECONOMICS 102: FALL 1971

Brookdale Community College

Economics 102 is designed to introduce both the major and nonmajor to the fundamental concepts and theory of economics and to show its relevance to the problems of the county, state, nation, and world.

The course is structured on the audiotutorial mode of instruction, with one general assembly session per week where students receive the objectives for that week. A two-hour session follows, in which students can engage in one or all of the following activities: (1) join a small assembly session, discussing a topic of interest to them; (2) use the learning packages and other media such as tapes, transparencies, sound filmstrips, films, film-loops, maps, and charts; and (3) participate in various projects organized by the instructor out in the community.

At the beginning of the semester, students are given a contract to sign (after reading it). The contract is a commitment by both the instructor and the student to fulfill each of his responsibilities. The concluding paragraph of the contract reads:

> This contract between each one of you and myself is to underscore your responsibility to yourself and to the course for which you have registered. It is, in essence, a statement underscoring our mutual responsibilities. My signature is my word that I shall assume and execute these responsibilities. I ask each one of you to do the same.

The course is divided into a series of five units. Each unit contains several behaviorally stated objectives. Depending on the student's interest in the objective and his reason for enrolling, he chooses one of three methods of achieving the objective, each method reflecting a different level of mastery. The first level involves understanding definition of terms, for which the student can receive "credit" on the objective. The second level involves some form of application of the student's knowledge, for which he can receive on the objective "credit with honors." (This second level requires that the students first understand the definitions in the unit.) The third level of mastery requires the student to understand abstractions, for which he can receive for that objective "credit with high honors." (This third level, to be successfully mastered, requires that the student first master the other two levels.)

While the instructor has taught the course for six semesters, he still has to spend long hours each semester revising the materials. He estimates that preparation and revisions of materials have taken approximately 25 hours per week.

The instructor believes that the audiotutorial method is working well. He feels that the performance contract helps to establish mutual responsibility between the instructor and the student and that the method of organization can be used by other courses and other disciplines, although with appropriate revisions according to the subject matter.

ELECTRONICS 230: WINTER 1971

Brookdale Community College

Electronics 230 is designed to acquaint students with the basic principles of power supplies, circuit analysis, basic oscillators, RF amplifiers, transmitters, receivers, and transistor applications to basic circuits.

Under the audiotutorial method of instruction, students spend two hours per week in group instruction and four hours in independent laboratory sessions. While all begin on the first of the course's six units, they work at their individual rate of learning and can complete the course before the end of the semester. There is no attempt to record the amount of time students spend in the independent laboratory sessions.

The two instructors agree that released time will be a great help in revising the course material. They estimate, from having taught the course for two semesters, that they have spent 60-80 hours per semester in revisions of three kinds: (1) refining existing material; (2) adding to existing learning packages; and (3) creating supplementary material.

The two instructors believe in the audiotutorial method of instruction because they think it is important for students to work independently. The instructional laboratory provides this kind of exposure and training. To help students adjust to this independence of learning, they keep the first two weeks of the course traditionally structured, serving as a transitional period for the students.

A number of media are used in the learning packages: programmed texts, tapes, filmstrips, film-loops, and transparencies. The instructors believe that the diversity of learning media helps students enjoy their learning experiences.

The students in the course are evaluated on the number of laboratory assignments completed during the semester. Those completing nine assignments receive "credit" for the course; those completing 16 assignments receive "credit with honors" in the course; and those completing 21 assignments receive "credit with high honors."

The instructors find that a major advantage of organizing a course on the audiotutorial mode of instruction is that more students can be handled effectively than under conventionally structured courses, but they believe that they have an additional responsibility for helping transfer students to adjust to the more traditional environment of four-year institutions.

ENGLISH A AND ENGLISH B: SPRING 1971

Golden West Community College
(Coast Community College District)

English A is a nine-week remedial course for freshmen. It is the first of a two-course sequence (before English B) designed to qualify the student for entry into the English 1A composition course. About 300 students meet for one hour per week in a general assembly session, where a highly skilled instructor attempts to develop student interest in the coming week's objectives. Also, students in these large groups are pretested to determine which skills they already possess. In short, the purpose of the general assembly session is to inspire students rather than to teach course facts.

Students also spend one half-hour in a seminar session and four additional hours weekly in an instructional laboratory. The independent study session is designed to allow students to work through the English materials at their own learning rate. The laboratory is equipped with carrels where students operate a series of slides with an accompanying tape. They can stop the slides and tape at any time and repeat any sequence that causes confusion. Their questions can also be answered by the instructors and assistants who spend many hours per week in the laboratory.

While both students and teachers are enthusiastic about the audiotutorial approach to the teaching of remedial English, one problem should be mentioned, namely the actual amount of time that students spend in the instructional laboratory. Those who do well in the course usually spend more than four hours per week; those not doing so well do not, many times, spend even the minimum amount of laboratory time required. While time cards are kept for each student, there is still no way to ensure that all students will do the required work each week.

English B is the second nine-week segment of a two-course sequence (after English A) for freshmen, designed to qualify them for entry into the English 1A composition course. The objectives of the course are to teach students: (1) to edit their own work; (2) to write expository paragraphs free of gross illiteracies; and (3) to write expository paragraphs that meet specified criteria.

Students meet two hours per week in self-contained classrooms in groups of approximately 30. In the last nine-week session of the 1971 spring semester, four instructors each taught one section of the course. Since each instructor prepares his own material, the team-teaching approach is not used.

The instructor says that the original revision of the course material took about four to six hours per week. Released time, she reports, is not really necessary for making continual improvements in the course or for revising any of the instructional materials. She has a student artist to create transparencies, most of them closely related to those used in the English A segment of the course. Some original transparencies are for conveying, with humor, certain concepts taught in the course. She works closely with the student artist so that the transparencies may indeed capture the essence of the concepts she wants taught.

The instructor stated that she would like to continue to make changes and revisions in her course material. Learning packages can be prepared, for example, but not necessarily kept in a learning laboratory. Students can use them in an open atmosphere and at their own need or convenience. The instructor added that the students will continue to meet an instructor during the week, since learning materials or individual study should not replace the services that can be provided only by an expert teacher.

Humanities I: Fall 1971

Sacramento City College
(Los Rios Community College District)

Humanities I is a one-semester course designed to give students an interdepartmental view of Greece, Rome, and the Middle Ages by studying the philosophy, painting, sculpture, music, architecture, and literature of each period.

The course follows an audiotutorial mode of instruction. Each week students meet for one hour in a general assembly session, with a choice between Monday morning and Tuesday afternoon. At these sessions, the instructor designs his lectures to be both motivational and directional. He attempts both to interest the students in the coming week's material and to direct them to various sources where they can discover relevant information. Students unable to attend these sessions listen to tapes of the "lectures," which are stored in the Learning Resource Center.

Students also meet each week for one-hour small assembly sessions, which are limited to 25 students and many have far fewer enrolled. The sessions are structured informally to encourage students to attend and to participate in them. The instructor always begins each small assembly by asking whether students have any topics they are interested in discussing; the topics suggested must, of course, relate to the weekly instructional topic. Although roll is taken in these sessions, students are not penalized for absence, unless they are scoring poorly on the course tests.

Students are required to spend one hour per week in the Learning Resource Center viewing sets of slides accompanied by an auditory tape. These slides explicate much of the information given in the course text or provide additional information of interest. Students are allowed to spend as much time as they wish in viewing the slides, since the Learning Resource Center, with the help of paraprofessionals, is open during most of the daytime hours. Roll is taken in the Learning Resource Center by asking students to write their names on the check-out cards for the set of slides they have used each week. This information is used only to counsel students who are doing poorly in the course and to assess the value of the program.

All testing is administered in the general assembly sessions. Students may opt for the type of test they wish to take: objective, essay, or oral. The instructor says that at least 90 percent of the students select the objective test, but, whatever the type, it may be taken only once, and the score is recorded as the grade for the unit.

Humanities I was last taught by the instructor under the conventional mode in the spring of 1971. While the students followed the same testing procedure as currently used, they met for three hours per week in large group sessions to listen to traditional lectures. These sessions were not at all conducive to answering the questions students might have. Many were discouraged from asking questions in any event because of the large number enrolled in each section. Furthermore, no paraprofessionals were available under the conventional instructional mode.

Because students have greater enjoyment in learning under the audiotutorial mode than under the large group mode, the instructor enthusiastically recommends its use not only in all humanities courses, but also in other courses that need visual and auditory aids. It is his belief that both majors and nonmajors can benefit from the audiotutorial mode. Moreover, the audiotutorial course allows majors to develop and pursue many of their individual interests, since not all sets of slides are required viewing for all students but instead are available primarily for those especially interested in their subject matter.

MATHEMATICS 115: FALL 1971

Mesa Community College
(Maricopa County Community College District)

Mathematics 115 combines beginning and intermediate algebra in a single course. Its objective is to enable students to master the fundamentals of algebra in one semester.

The students meet each week for three one-hour general assembly sessions and for six hours in an instructional laboratory. As yet, they do not meet in small assembly sessions.

While the large group meeting (30 students) is designed primarily for testing, the instructional laboratory allows each student to progress through the material at his own pace. Twenty tape players are located in a converted classroom, which is open between 7:30 a.m. and 4:30 p.m. five days a week on a scheduled basis. The student checks out a tape, much as he would a reserve book, listens to it while working with the accompanying materials, and may rewind it to repeat any portion he does not understand.

The materials used in the course are published by the Merrill Publishing Company from the Fullerton Junior College Program, but they have been revised by combining units 1 to 13, 16 to 22, and unit 26 of the intermediate algebra course. Though the published tests are the basis for those used in the course, the instructors make revisions to measure accurately the mathematical concepts taught.

The course, as taught through the conventional mode, meets one hour a day for five days a week. All students meet in one large group (30 students). No small group meetings are scheduled. One textbook is used, and no other special material or equipment is required for the students.

The audiotutorial course took approximately 100 hours to organize; it required about 32 hours per semester to prepare and revise materials. On the other hand, the time required to organize the conventional course was less, only about 16 hours per semester, to prepare and revise the course material. The additional time needed to organize the audiotutorial course, in the instructor's view, warrants released time in some form or another.

The instructor believes that the audiotutorial mode is best suited for remedial work or for subjects required for all students. "Whenever students should have learned or acquired skills in secondary schools or need to acquire the skills as fast as possible, the audiotutorial mode of instruction should be utilized." In contrast, said the instructor, the self-contained classroom, or the conventional mode, is more suitable for students who are not self-directed learners.

NURSING 111: FALL 1971

Delta College

Nursing 111, one of a series that comprises the nursing program at the college, is a one-semester course taken by students as their initial nursing course in the two-year nursing program. For its instructional mode, it uses an audiotutorial system in combination with team teaching.

The students at the beginning of the week meet in a general assembly session, where they are introduced to the material they will be covering during the week. Before spending the required twelve hours per week in clinical work in a nearby hospital, students attend the audiotutorial laboratory, where they are instructed through tapes, slides, film-loops, and models in the nursing concepts they will later apply. In a given week, they can spend as long as they need in the laboratory to achieve the objectives. Since the twelve hours of clinical laboratory are spread over a three-day period, students attend the instructional laboratory before and after their hospital experience.

Students also spend an hour a week in a small assembly session and an hour in a quiz session. The small assembly session permits student-faculty interaction. Both sessions are limited to 15 students each. In the quiz sections, each limited to seven or eight students, both oral and written tests are given on the week's instructional material.

The team leaders prepare the learning packages used in the audiotutorial laboratory. Team members, both full-time and part-time instructors, are responsible for the students during their clinical laboratory in the hospital and in the small group and quiz sessions.

The teaching roles have been differentiated between the team leaders and the team members. Except for the general assembly sessions and instructional laboratory, team leaders participate only indirectly in student instruction, but act as advisers or consultants to the team members. The team members may not help to prepare the materials in learning packages unless they have specific expertise.

Under the conventional instructional mode, students spent five hours per week in a self-contained classroom where they listened to lectures. Because there was no instructional laboratory, a college laboratory was constructed, but, though four hours were spent in it, it did not succeed very well in simulating a hospital unit. Finally, students spent eight hours per week in clinical laboratory.

The instructors state that the students prefer the course under the audiotutorial instructional mode because it allows them to achieve more effectively in clinical laboratory and that the audiotutorial laboratory, with its use of various media, is more effective in teaching the medical concepts and procedures than the college laboratory under the traditional instructional mode. Lastly, the teachers each comment on the increased enrollment that can be handled by the new instructional approach. Under the traditional mode, only a relatively few students were admitted to the nursing program each year.

Each instructor stated that the audiotutorial instructional mode should be used for courses where students are taught "how to do something" or in subjects where they have to practice skills. The only reservation is the size of the audiotutorial laboratory—since the laboratory is now used by several other courses, the instructors believe that it can no longer accommodate effectively the number of nursing students.

PSYCHOLOGY 1A: FALL 1971

Foothill Community College District

Psychology 1A is an eleven-week introductory course in basic principles of psychology. It uses an audiotutorial mode of instruction in an effort to individualize the student learning. Unlike the typical course taught under the audiotutorial mode, however, it makes extensive use of student-peer teaching.

Students meet one hour per week in a general assembly session, where they are exposed to guest lectures, films, and occasionally traditional lectures by the course instructor. Since the material provided in these sessions is considered to be enrichment, the students are not held accountable for it on any of the course tests. Roll is not taken in these sessions.

Students attend no small assembly sessions, but they attend an instructional laboratory that is open between 9:00 a.m. and 3:00 p.m. every day. Each student is encouraged to spend as many hours as he desires in the laboratory; accordingly no blocks of time are reserved for him in any of the carrels.

At present, audiotapes are the only medium used in the course. (In the near future slides will also be used.) Each carrel contains a tape representing one of the course's twelve units. These tapes are retained at the same carrels during the entire eleven-week period so that students may move as slowly or rapidly through the course as they wish. Those who finish all the units are permitted to take the final examination in the laboratory and thereby complete the course. Those who cannot finish all twelve of the units by the end of the quarter are permitted to complete the course during the ensuing eleven-week quarter. The following statement is from a student handout given at the beginning of the course:

> A number of you will need more than one quarter to complete all the material. Almost everyone who is going to finish will do it in two quarters. For this reason those of you who do not finish will receive a NC grade which will be erased from your grades if you complete the course the following quarter. After that each case will be judged on an individual basis.*

---

*Students not completing the course at the end of the quarter receive a grade of "W" (withdrawal). Therefore, the number of W's is abnormally high compared to the number of W's given in a conventional course that conceives of withdrawing students as those unable to perform the required work established for the course.

Test questions are not based on the material presented through the audiotapes, but are taken from a series of readings and exercises published by Individual Learning Systems. The instructor feels that these materials are superior to a traditional textbook of psychological readings because the students are actively participating in these pseudo-programmed materials.

Whenever a student has completed a unit (both the printed and taped material), he is administered a short, multiple-choice, 20-question test by a "facilitator" (defined as a student enrolled in the course who at the beginning of the quarter says he is willing to work ahead of the other students in the required units). The facilitator will immediately correct the test in the presence of the student and inquire whether any of the incorrect answers are caused merely by misreading. If the student can demonstrate to the facilitator that he understands the concept behind the test item, he is given credit for it. He is therefore evaluated on only those items of which he clearly lacks knowledge. Students scoring 80 percent or higher are permitted to begin the next unit. Those unable to score 80 percent are directed by the facilitator back to the unit for additional work. At a later time, these students are given an alternate form of the test. If again they do not achieve an 80 percent, they are directed to the course instructor for remediation.

While the course has a high enrollment, it has no paraprofessionals other than student facilitators and student proctors. Like the facilitators, the proctors are also students, but they have earlier completed the course and are now providing instructional assistance for current students. For their services, the proctors receive two units of honor credit.

The instructor enthusiastically endorses the approach she is using to individualize instruction. In the past she taught the course in a large group instructional mode where the students met each week for four one-hour sessions. She feels that, judged by learning outcomes, the course under the audiotutorial mode is far more effective than under the large group mode. She admits, however, that under the audiotutorial mode much more time is required to prepare tapes than was needed for the conventional lectures given in the large group mode. She is so optimistic about the direction her course has taken that she wants educators throughout the country to explore the use of student-peer teaching under the audiotutorial mode of instruction.

APPENDIX A

LARGE GROUP MODE

TABLE A-1

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Elementary Algebra
Time Period: 16 weeks
Actual Enrollment: 77
Optimum Enrollment: 70

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$7,041
3/15	$9,681

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
7 hrs./wk. @ $1.60 /hr.	$179

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	(none)	--	--
Special	(none)	--	--

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$2,347	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,344	43.43	47.77	88.98
P[illegible]ofes-s[illegible]nal Salaries	$179	2.32	2.56	4.76
General Equipment	(none)	--	--	--
Special Equipment	(none)	--	--	--
Materials	$235	3.05	3.36	6.25
Total Cost	$3,758	48.81	53.69	

TABLE A-2

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Elementary Algebra
Time Period: 16 weeks
Actual Enrollment: 35
Optimum Enrollment: 35

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$7,041

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	(none)	--	--
Special	(none)	--	--

Supplies and Other Materials

Item	Value	Depreciation
(none)	-	-

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,408	40.23	40.23	100.00
Paraprofessional Salaries	(none)	-	-	-
General Equipment	(none)	-	-	-
Special Equipment	(none)	-	-	-
Materials	(none)	-	-	-
Total Cost	$1,408	40.23	40.23	

TABLE A-3

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Intermediate Algebra

Time Period: 15 weeks

Actual Enrollment: 59

Optimum Enrollment: 115

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$7,745

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,549	26.25	13.47	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$1,549	26.25	13.47	

TABLE A-4

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Intermediate Algebra

Time Period: 15 weeks

Actual Enrollment: 45

Optimum Enrollment: 45

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$7,745

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,549	34.42	34.42	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$1,549	34.42	34.42	

TABLE A-5

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Anthropolgy 2
Time Period: 17 weeks
Actual Enrollment: 265
Optimum Enrollment: 300

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/15	$7,740

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/40	$3,435

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
tapes	$370	10 sem.
slides/films	$225	10 sem.
transparencies	$28	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$7,740	29.21	25.80	96.03
Paraprofessional Salaries	$258	.97	.86	3.20
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$62	.23	.21	.76
Total Cost	$8,060	30.41	26.87	

TABLE A-6

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Anthropology 2

Time Period: 17 weeks

Actual Enrollment: 185

Optimum Enrollment: 200

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
9/15	$7,740
6/15	$9,707

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3 hrs/wk. @ 1.65 /hr.	$84

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
films	$100	10 sem.
slides	$75	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$8,527	46.09	42.63	98.83
Paraprofessional Salaries	$84	.45	.42	.97
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$17	.09	.08	.20
Total Cost	$8,628	46.64	43.14	

TABLE A-7

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Biology 101

Time Period: 10 weeks

Actual Enrollment: 236

Optimum Enrollment: 675

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/12	$4,333

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
40 hrs/wk. @ $3.00 /hr.	$1,200

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$10,000	667	60 qtrs.
Special	$15,000	236	60 qtrs.

Supplies and Other Materials

Item	Value	Depreciation
software materials	$500	15 qtrs.
course preparation	$300	15 qtrs.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,333	18.36	6.42	73.50
Paraprofessional Salaries	$1,200	5.08	1.78	20.36
General Equipment	$59	.25	.09	1.00
Special Equipment	$250	1.06	.37	4.24
Materials	$53	.22	.08	.90
Total Cost	$5,895	24.98	8.73	

TABLE A-8

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Biology 101

Time Period: 10 weeks

Actual Enrollment: 226

Optimum Enrollment: 240

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/12	$4,333
12/12	$3,833
6/12	$4,166
12/12	$1,916

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Not identified	$2,000

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$15,000	226	60 qtrs.
Special	$20,000	226	60 qtrs.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$800	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$12,165	53.83	50.69	78.24
Paraprofessional Salaries	$2,000	8.85	8.33	12.86
General Equipment	$250	1.11	1.04	1.61
Special Equipment	$333	1.47	1.39	2.14
Materials	$800	3.54	3.33	5.15
Total Cost	$15,548	68.80	64.78	

TABLE A-9

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Data Processing 101
Time Period: 11 weeks
Actual Enrollment: 125 (two sections)
Optimum Enrollment: 240 (two sections)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4/12	$4,600
4/12	$3,250

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	$104	125	9 qtrs.

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$500	15 qtrs.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$2,616	20.93	10.90	98.31
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	$12	.10	.05	.45
Materials	$33	.26	.14	1.24
Total Cost	$2,661	21.29	11.09	

TABLE A-10

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Data Processing 101

Time Period: 11 weeks

Actual Enrollment: 123 (3 sections)

Optimum Enrollment: 120 (3 sections)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/12	$3,250

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,250	26.42	27.08	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$3,250	26.42	27.08	

TABLE A-11

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: English 50
Time Period: 18 weeks
Actual Enrollment: 364
Optimum Enrollment: 364

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/12	$8,145
6/12	$6,216

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
These readers were employed	$878
for various hrs.	

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	$1,083	364	10 sem.

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$7,180	19.73	19.73	87.93
Paraprofessional Salaries	$878	2.41	2.41	10.75
General Equipment	none	--	--	--
Special Equipment	$108	.30	.30	1.32
Materials	none	--	--	--
Total Cost	$8,166	22.43	22.43	

TABLE A-12

DIRECT COSTS OF INSTRUCTION FOR
THE CONVENTIONAL MODE

Course Title: **English 50**

Time Period: **18 weeks**

Actual Enrollment: 519

Optimum Enrollment: 510

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/15	$5,409
3/12	$8,145
12/15	$8,145

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
These readers were employed	$714
for various hrs	

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

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TABLE A-12 continued

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: English 50 - continued

Time Period: ______

Actual Enrollment: ______

Optimum Enrollment: ______

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/15	$8,145
6/15	$6,690
3/15	$6,615

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

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TABLE A-12 continued

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: **English 50 - continued**

Time Period: __________

Actual Enrollment: __________

Optimum Enrollment: __________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/15	$6,987
6/15	$7,585
3/15	$6,231

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$24,956	48.08	48.93	97.22
Paraprofessional Salaries	$714	1.38	1.40	2.78
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$25,670	49.46	50.33	

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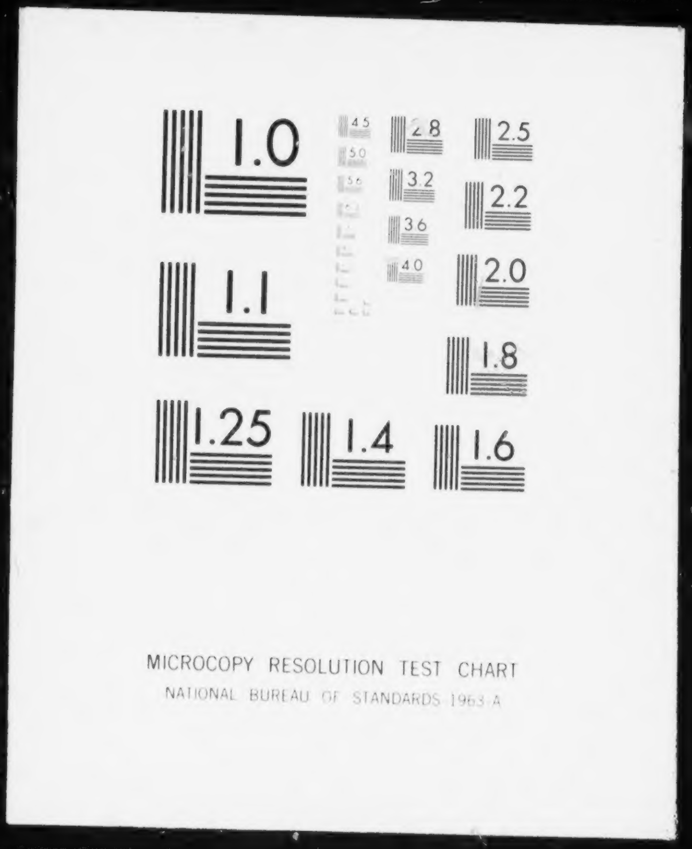
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MICROCOPY RESOLUTION TEST CHART
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TABLE A-13

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: English Composition 11

Time Period: 17 weeks

Actual Enrollment: 68

Optimum Enrollment: 120

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/12	$5,351
3/12	$6,358
3/12	$6,900

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$150	consumed
course preparation	$2,976	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,652	68.41	36.77	91.22
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$448	6.59	3.73	8.78
Total Cost	$5,100	75.00	42.50	

TABLE A-14

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: English Composition II

Time Period: 17 weeks

Actual Enrollment: 26

Optimum Enrollment: 28

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/12	$5,351

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,338	51.46	47.79	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$1,338	51.46	47.79	

TABLE A-15

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Economics 111

Time Period: 15 weeks

Actual Enrollment: 152

Optimum Enrollment: 200

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Full-Time	$7,190

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
staff works on various schedules	$1,201

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	$175	152	8 sem.

Supplies and Other Materials

Item	Value	Depreciation
software materials	$3,181	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$7,190	47.30	35.95	82.35
Paraprofessional Salaries	$1,201	7.90	6.00	13.76
General Equipment	none	--	--	--
Special Equipment	$22	.14	.11	.25
Materials	$318	2.09	1.59	3.64
Total Cost	$8,731	57.44	43.65	

TABLE A-16

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Economics 111
Time Period: 15 weeks
Actual Enrollment: 131
Optimum Enrollment: 140

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Full-Time	$7,190

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
transparencies	$10	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$7,190	54.89	51.36	99.99
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$1	.01	.01	.01
Total Cost	$7,191	54.89	51.36	

TABLE A-17

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: History 111

Time Period: 16 weeks

Actual Enrollment: 281

Optimum Enrollment: 450

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/15	$6,993

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4 hrs./wk @ $1.60 /hr.	$109
Summer work	$30

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$3,000	281	10 sem.
Special	$1,000	281	10 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$15	consumable
course preparation	$980	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$6,993	24.89	15.54	82.01
Paraprofessional Salaries	$139	.49	.31	1.63
General Equipment	$300	1.07	.67	3.52
Special Equipment	$100	.36	.22	1.17
Materials	$995	3.54	2.21	11.67
Total Cost	$8,527	30.35	18.95	

TABLE A-18

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: History 111

Time Period: 16 weeks

Actual Enrollment: 46

Optimum Enrollment: 50

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$7,821

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
50 hrs/sem. @ $1.60	$80

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$30	consumable

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,564	34.00	31.28	93.43
Paraprofessional Salaries	$80	1.74	1.60	4.78
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$30	.65	.60	1.79
Total Cost	$1,674	36.39	33.48	

TABLE A-19

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Home Economics 141

Time Period: 18 weeks

Actual Enrollment: 152

Optimum Enrollment: 200

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Total stipend for teaching course	$1,000

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
$1.60 per hr.	$230

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$100	consumable

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,000	6.58	5.00	75.19
Paraprofessional Salaries	$230	1.51	1.15	17.29
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$100	.66	.50	7.52
Total Cost	$1,330	8.75	6.65	

TABLE A-20

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Home Economics 141

Time Period: 18 weeks

Actual Enrollment: 98

Optimum Enrollment: 100

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2/15	$7,284
2/15	$8,792

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
unidentified	$200

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$158	consumable

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$2,143	21.87	21.43	85.69
Paraprofessional Salaries	$200	2.04	2.00	8.00
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$158	1.61	1.58	6.32
Total Cost	$2,501	25.52	25.01	

TABLE A-21

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Humanities 101
Time Period: 10 weeks
Actual Enrollment: 89
Optimum Enrollment: 100

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/12	$2,650
3/12	$3,100
3/12	$4,450

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
course outlines	$100	consumed
course preparation	$1,000	20 qtrs.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$2,550	28.65	25.50	94.44
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$150	1.69	1.50	5.56
Total Cost	$2,700	30.34	27.00	

TABLE A-22

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Philosophy 101

Time Period: 10 weeks

Actual Enrollment: 43

Optimum Enrollment: 45

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4/12	$2,650

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$883	20.53	19.62	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$883	20.53	19.62	

TABLE A-23

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Music 141

Time Period: 15 weeks

Actual Enrollment: 96

Optimum Enrollment: 200

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Over and above his regular load	$400

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2 hrs./week @ $2.874 per wk.	$86

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$4,150	800	20 sem.
Special	$260	96	16 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$60	consumable

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$400	4.17	2.00	68.14
Paraprofessional Salaries	$86	.90	.43	14.65
General Equipment	$25	.26	.12	4.26
Special Equipment	$16	.17	.08	2.73
Materials	$60	.62	.30	10.22
Total Cost	$587	6.11	2.93	

TABLE A-24

DIRECT COSTS OF INSTRUCTION FOR
THE CONVENTIONAL MODE

Course Title: Music 141

Time Period: 15 weeks

Actual Enrollment: 191

Optimum Enrollment: 240

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4/15	$8,228
4/15	$7,888
2/6	$1,340

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$4,150	800	20 sem.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

continued on next page .

TABLE A-24 continued

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Music 141 - continued

Time Period: 15 weeks

Actual Enrollment: 191

Optimum Enrollment: 240

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2/15	$7,654

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equip-ment	Depre-ciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enroll-ment	Optimum Enroll-ment	
Professional Salaries	$5,921	31.00	24.67	99.16
Paraprofes-sional Salaries	none	--	--	--
General Equipment	$50	.26	.21	.84
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$5,971	31.26	24.88	

TABLE A-25

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Psychology 100

Time Period: 17 weeks

Actual Enrollment: 2212

Optimum Enrollment: 2002

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
7/15	$9,194
7/15	$8,943
7/15	$7,906

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Full-Time	$3,130
Full-Time	$3,402
Full-Time	$421

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	$1,150	2,212	10 sem.

Supplies and Other Materials

Item	Value	Depreciation
transparencies	$1,000	10 sem.
commercial audio tapes	$75	10 sem.
2 x 2 slide sets	$300	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

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TABLE A-25 continued

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Psychology 100 - continued

Time Period: ____________________

Actual Enrollment: ______________

Optimum Enrollment: ______________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
7/15	$8,569
7/15	$7,283
7/15	$8,321

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation
2 x 2 slides (copies)	$225	10 sem.
transparencies(copies)	$200	10 sem.
audio tapes (copies)	$900	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

continued on next page . .

TABLE A-25 continued

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Psychology 100 - continued

Time Period: ____________________

Actual Enrollment: ______________

Optimum Enrollment: ______________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
7/15	$7,906
7/15	$8,221
7/15	$6,910

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation
video tapes	$1,500	10 sem.
consortium (TV)	$500	10 sem.
consortium tapes	$1,260	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

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TABLE A-25 continued

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Psychology 100 - continued

Time Period: ____________________

Actual Enrollment: ______________

Optimum Enrollment: ______________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
7/15	$3,247
7/15	$6,868
7/15	$7,306

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation
miscrofiche & copies	$100	10 sem.
master drawings	$80	10 sem.
3M master drawing set	$20	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

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TABLE A-25 continued

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Psychology 100 - continued

Time Period: ______

Actual Enrollment: ______

Optimum Enrollment: ______

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
7/15	$7,906
7/15	$7,491
7/15	$8,113

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation
guidance kit	$720	10 sem.
16 mm films	$960	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

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TABLE A-25 continued

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Psychology 100 - continued

Time Period: ____________

Actual Enrollment: ____________

Optimum Enrollment: ____________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
7/15	$8,597
7/15	$6,910
7/15	$7,698

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

continued on next page . . .

TABLE A-25 continued

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Psychology 100 - continued

Time Period: ______

Actual Enrollment: ______

Optimum Enrollment: ______

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
7/15	$8,279

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$67,983	30.73	33.96	82.01
Paraprofessional Salaries	$6,953	3.14	3.47	8.39
General Equipment	none	--	--	--
Special Equipment	$115	.05	.06	.14
Materials	$7,840	3.54	3.92	9.46
Total Cost	$82,891	37.47	41.40	

TABLE A-26

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Social Science 103
Time Period: 11 weeks
Actual Enrollment: 201
Optimum Enrollment: 220

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/12	$4,604

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15 hrs./wk.	$2,100
10 hrs./wk. @ $1.65/hr.	$181

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$3,529	15 qrts.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,151	5.73	5.23	31.39
Paraprofessional Salaries	$2,281	11.34	10.37	62.20
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$235	1.17	1.07	6.41
Total Cost	$3,667	18.24	16.67	

TABLE A-27

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Social Science 103

Time Period: 11 weeks

Actual Enrollment: 40

Optimum Enrollment: 45

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/12	$4,604

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equip-ment	Depre-ciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enroll-ment	Optimum Enroll-ment	
Professional Salaries	$1,151	28.77	25.58	100.00
Paraprofes-sional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$1,151	28.77	25.58	

TABLE A-28

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Sociology 211
Time Period: 15 weeks
Actual Enrollment: 270
Optimum Enrollment: 270

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/12	$8,446

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10 hrs./wk. in total	$812
Not identified	$483

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$300	470	20 sem.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$108	consumed
software materials	$1,146	10 sem.
tape play-back time & tape stock	$1,960	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enroll-ment	Optimum Enroll-ment	
Professional Salaries	$8,446	31.28	31.28	70.78
Paraprofessional Salaries	$1,295	4.80	4.80	10.85
General Equipment	$9	.03	.03	.08
Special Equipment	none	--	--	--
Materials	$2,183	8.09	8.09	18.29
Total Cost	$11,933	44.20	44.20	

TABLE A-29

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Sociology 211
Time Period: 15 weeks
Actual Enrollment: 109
Optimum Enrollment: 108

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
9/12	$8,446

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$35	consumed
films	$50	semester rental

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$6,334	58.11	58.65	98.68
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$85	.78	.79	1.32
Total Cost	$6,419	58.89	59.44	

TABLE A-30

DIRECT COSTS OF INSTRUCTION FOR THE LARGE GROUP MODE

Course Title: Sociology 101
Time Period: 18 weeks
Actual Enrollment: 257
Optimum Enrollment: 300

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/15	$7,900

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$6,320	24.59	21.07	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$6,320	24.59	21.07	

TABLE A-31

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Sociology 101

Time Period: 18 weeks

Actual Enrollment: 444

Optimum Enrollment: 440

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
9/15	$8,531
15/15	$8,531
9/15	$4,326

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$16,245	36.59	36.92	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$16,245	36.59	36.92	

APPENDIX B

THE INDIVIDUALIZED PROGRAMED MODE

TABLE B-1

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Accounting 142

Time Period: 18 weeks

Actual Enrollment: 144

Optimum Enrollment: 40

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/21	$7,055

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--.	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
miscellaneous	$ 10	consumable
course preparation	$10,000	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,031	27.99	100.78	97.34
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 110	.76	2.75	2.66
Total Cost	$4,141	28.76	103.53	

TABLE B-2

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Accounting 142
Time Period: 18 weeks
Actual Enrollment: 90
Optimum Enrollment: 90

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
9/18	$6,864.30

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$10	consumable

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,432	38.13	38.13	99.71
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 10	.11	.11	.29
Total Cost	$3,442	38.24	38.24	

TABLE B-3

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Automotive Electrical Systems
Time Period: 11 weeks
Actual Enrollment: 64
Optimum Enrollment: 75

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
16/22	$3,050
16/22	$2,169
16/22	$2,169

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$15,221/ $5,000	115/165	40 qtrs.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
supplies	$ 150	consumed
software materials	$1,100	20 qtrs.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$5,373	83.95	71.64	92.00
Paraprofessional Salaries	none	--	--	--
General Equipment	$ 262	4.09	3.49	4.49
Special Equipment	none	--	--	--
Materials	$ 205	3.20	2.73	3.51
Total Cost	$5,840	91.25	77.87	

TABLE B-4

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Automotive Electrical Systems

Time Period: 11 weeks

Actual Enrollment: 38

Optimum Enrollment: 40

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
16/22	$3,050
16/22	$2,169

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$8,000	145	40 qtrs.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
filmstrips	$100	20 qtrs

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,796	99.89	94.90	98.52
Paraprofessional Salaries	none	--	--	--
General Equipment	$ 52	1.37	1.30	1.35
Special Equipment	none	--	--	--
Materials	$ 5	.13	.13	.13
Total Cost	$3,853	101.39	96.32	

TABLE B-5

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Data Processing 1
Time Period: 11 weeks
Actual Enrollment: 24
Optimum Enrollment: 40

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
5/14	$5,666

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	-- --

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$80,000	900	33 qtrs.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$1,500	15 quarters
audiotapes	$ 50	15 quarters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$2,023	84.29	50.57	92.33
Paraprofessional Salaries	None	--	--	--
General Equipment	$ 65	2.71	1.62	2.97
Special Equipment	none	--	--	--
Materials	$ 103	4.29	2.57	4.70
Total Cost	$2,191	91.29	54.77	

TABLE B-6

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Data Processing 1
Time Period: 11 weeks
Actual Enrollment: 30
Optimum Enrollment: 50

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
9/14	$5,661

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$80,000	900	33 qtrs.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,639	121.30	72.78	97.82
Paraprofessional Salaries	none	--	--	--
General Equipment	$ 81	2.70	1.62	2.18
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$3,720	124.00	74.40	

TABLE B-7

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Developmental Mathematics - Elementary Algebra
Time Period: 16 weeks
Actual Enrollment: 626
Optimum Enrollment: 800

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/15	$6,358
12/15	$5,838
part-time	$ 780

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
40/40	$2,870
40/40	$2,708
16/16	$ 525

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$1,800	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

continued on next page . . .

TABLE B-7--continued

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Developmental Mathematics-Elementary Algebra (continued)

Time Period: ____________________

Actual Enrollment: ____________

Optimum Enrollment: ____________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
part-time	$1,560
part-time	$ 780

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
16/16	$ 525

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$12,877	20.57	16.10	65.42
Paraprofessional Salaries	$ 6,628	10.59	8.29	33.67
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 180	.29	.23	.91
Total Cost	$19,685	31.45	24.61	

TABLE B-8

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Developmental Mathematics

Time Period: 16 weeks

Actual Enrollment: 30

Optimum Enrollment: 25

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$6,000

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
$41/week	$656

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,200	40.00	48.00	64.66
Paraprofessional Salaries	$656	21.87	26.24	35.34
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$1,856	61.87	74.24	

TABLE B-9

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Dictation - Transcription I
Time Period: 15 weeks
Actual Enrollment: 5
Optimum Enrollment: 15

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
11.11%	$4,541

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$1,784	45	10 sems.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
Tapes	$218	10 sems.
Course Preparation	$530	10 sems.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$505	101.00	33.67	84.17
Paraprofessional Salaries	none	--	--	--
General Equipment	$ 20	4.00	1.33	3.33
Special Equipment	none	--	--	--
Materials	$ 75	15.00	5.00	12.50
Total Cost	$600	120.00	40.00	

TABLE B-10

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Economics II

Time Period: 16 weeks

Actual Enrollment: 24

Optimum Enrollment: 85

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$5,020

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,004	41.83	11.81	100.00
Paraprofessional Salaries	--	--	--	--
General Equipment	--	--	--	--
Special Equipment	--	--	--	--
Materials	none	--	--	--
Total Cost	$1,004	41.83	11.81	

TABLE B-11

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Economics II

Time Period: 16 weeks

Actual Enrollment: 22

Optimum Enrollment: 44

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$5,020

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percent of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,004	45.64	22.82	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$1,004	45.64	22.82	

TABLE B-12

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Electronic Repair 50

Time Period: 18 weeks

Actual Enrollment: 60

Optimum Enrollment: 125

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
44.44%	$8,000

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
20 hrs/week @$3.50/hr	$1,260
5 hrs/week @$1.50/hr	$ 405

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	(A)$10,000 (B)$ 400	70 130	10 sems.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc.	$300	consumed
tapes, slides	$625*	10 semesters

*130 students utilize the software

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,555	59.25	28.44	55.05
Paraprofessional Salaries	$1,665	27.75	13.32	25.78
General Equipment	$ 876	14.60	7.01	13.56
Special Equipment	--	--	--	--
Materials	$ 362	6.03	2.90	5.60
Total Cost	$6,458	107.63	51.66	

TABLE B-13

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Electronic Repair 50

Time Period: 18 weeks

Actual Enrollment: 30

Optimum Enrollment: 30

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
13/28	$8,000

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$20,000	45	10 sems.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc.	$400	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,714	123.80	123.80	68.18
Paraprofessional Salaries	none	--	--	--
General Equipment	$1,333	44.43	44.43	24.47
Special Equipment	none	--	--	--
Materials	$400	13.33	13.33	7.34
Total Cost	$5.447	181.57	181.57	

TABLE B-14

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: English 1
Time Period: 17 weeks
Actual Enrollment: 57
Optimum Enrollment: 100

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/12	$8,740

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$1,750	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,370	76.67	43.70	96.15
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 175	3.07	1.75	3.85
Total Cost	$4,545	79.74	45.45	

TABLE B-15

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: English 1

Time Period: 17 weeks

Actual Enrollment: 84

Optimum Enrollment: 70

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/12	$8,740

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none -	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4.370	52.02	62.43	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$4,370	52.02	62.43	

TABLE B-16

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: English 28
Time Period: 18 weeks
Actual Enrollment: 59
Optimum Enrollment: 50

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
16/16	$4,800

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Employed between 2-10 hrs per week	$1,044

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$3,000	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,800	81.36	96.00	78.12
Paraprofessional Salaries	$1,044	17.69	20.88	16.99
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 300	5.08	6.00	4.88
Total Cost	$6,144	104.88	122.88	

TABLE B-17

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: English 28
Time Period: 18 weeks
Actual Enrollment: 81 (2 sections)
Optimum Enrollment: 50 (2 sections)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
8/8	$3,950

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,950	48.77	79.00	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$3,950	48.77	79.00	

TABLE B-18

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: English A

Time Period: 2 nine-week sessions

Actual Enrollment: 118

Optimum Enrollment: 373

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/15	$6,034

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
20 hrs/week @$3.50/hr	$1,260

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$400	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,827	40.91	12.94	78.78
Paraprofessional Salaries	$1,260	10.68	3.38	20.56
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 40	.34	.11	.65
Total Cost	$6,127	51.92	16.43	

TABLE B-19

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: English A
Time Period: 2 nine-week sessions
Actual Enrollment: 90
Optimum Enrollment: 120

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/15	$6,034

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,827	53.63	40.22	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$4,827	53.63	40.22	

TABLE B-20

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: English X

Time Period: 18 weeks

Actual Enrollment: 512

Optimum Enrollment: 560 (40 per section)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
9/15	$6,124
9/15	6,124
9/15	5,392

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
25 hrs/week @$3.50/hr	$1,575
13.5 hrs/week @$2.07/hr	503
90 hrs/week @$1.65/hr.	1,336

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$750	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials	$			
Total Cost				

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TABLE B-20--continued

DIRECT COSTS OF INSTRUCTION FOR
THE INDIVIDUALIZED PROGRAMED MODE

Course Title: English X - continued
Time Period: ____________
Actual Enrollment: ____________
Optimum Enrollment: ____________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/15	$ 7,486
3/15	8,113
6/15	5,530

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$17,413	34.01	31.09	83.31
Paraprofessional Salaries	$ 3,414	6.67	6.10	16.33
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 75	.15	.13	.36
Total Cost	$20,902	40.82	37.32	

TABLE B-20--continued

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: English X - continued

Time Period: __________

Actual Enrollment: __________

Optimum Enrollment: __________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/15	$ 7,486
3/15	8,113
6/15	5.530

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$17,413	34.01	31.09	83.31
Paraprofessional Salaries	$ 3,414	6.67	6.10	16.33
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 75	.15	.13	.36
Total Cost	$20,902	40.82	37.32	

TABLE B-21--continued

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: English X - continued

Time Period: ________

Actual Enrollment: ________

Optimum Enrollment: ________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/14	$8,113

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$10,019	75.90	47.71	100.00
Paraprofessional Salaries	$ none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$10,019	75.90	47.71	

TABLE B-22

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: General Physics
Time Period: 12 weeks
Actual Enrollment: 42
Optimum Enrollment: 25

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4/12	$3,600

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10 hrs/week @$1.60/hr	$ 192

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$5,000	120	51 qtrs.
Special	$ 200	42	30 qtrs.

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,200	28.57	48.00	83.74
Paraprofessional Salaries	$192	4.57	7.68	13.40
General Equipment	$34	.81	1.36	2.37
Special Equipment	$ 7	.17	.28	.49
Materials	none	--	--	--
Total Cost	$1,433	34.12	57.32	

TABLE B-23

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: General Physics

Time Period: 12 weeks

Actual Enrollment: 29

Optimum Enrollment: 30

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4/12	$3,600

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10 hrs/week @$1.60/hr.	$192

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$5,000	120	51 qtrs.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,200	41.38	40.00	84.75
Paraprofessional Salaries	$ 192	6.62	6.40	13.56
General Equipment	$ 24	.83	.80	1.69
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$1,416	48.83	47.20	

TABLE B-24

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Graphic Arts 50
Time Period: 18 weeks
Actual Enrollment: 70 (2 sections)
Optimum Enrollment: 60 (2 sections)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/13	$7,731

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4 hrs/week @$3.50/hr	$ 252
Ranges from 4-15 hrs/week @$1.60/hr	$2,002

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$29,000	125	20 sems.
Special	$1,000	70	20 sems.

Supplies and Other Materials

Item	Value	Depreciation
miscellaneous	$1,000	consumed
course preparatio	$ 600	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$2,651	37.87	44.18	38.83
Paraprofessional Salaries	$2,254	32.20	37.57	33.02
General Equipment	$ 812	11.60	13.53	11.89
Special Equipment	$ 50	.71	.83	.73
Materials	$1,060	15.14	17.67	15.53
Total Cost	$6,827	97.53	113.78	

TABLE B-25

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Graphic Arts 50

Time Period: 18 weeks

Actual Enrollment: 35 (1 section)

Optimum Enrollment: 15 (1 section)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/25	$7.731

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15 hrs. /week @$1.60/hr.	$432

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$29,000	100	20 sems.
Special	$1,000	35	20 sems.

Supplies and Other Materials

Item	Value	Depreciation
misc.	$800	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,855	53.00	123.67	50.91
Paraprofessional Salaries	$ 432	12.34	28.80	11.86
General Equipment	$ 507	14.49	33.80	13.91
Special Equipment	$ 50	1.43	3.33	1.37
Materials	$ 800	22.86	53.33	21.95
Total Cost	$3,644	104.11	242.93	

TABLE B-26

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Keypunch and Data Recording
Time Period: 80 hours
Actual Enrollment: 134
Optimum Enrollment: 225

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
35/35	$3,600

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
40/40	$2,385
18/18	$2,560
8/8	$ 880

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	(A)$800 (B) $5,062	134	20 sems. semester rental

Supplies and Other Materials

Item	Value	Depreciation
IBM cards	$750	consumed
course preparation	$200	10 semesters

	Total Cost	Cost Per Student: Actual Enrollment	Cost Per Student: Optimum Enrollment	Percentage of Total Cost
Professional Salaries	$ 3,600	26.87	16.00	23.53
Paraprofessional Salaries	$ 5,825	43.47	25.89	38.08
General Equipment	none	--	--	--
Special Equipment	$ 5,102	38.07	22.68	33.35
Materials	$ 770	5.75	3.42	5.03
Total Cost	$15,297	114.16	67.99	

TABLE B-27

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Keypunch and Data Recording
Time Period: 80 hours
Actual Enrollment: 63 (4 sections)
Optimum Enrollment: 60 (4 sections)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/15	$3,600

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
8/8	$ 800

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	$5,062	63	Semester rental

Supplies and Other Materials

Item	Value	Depreciation
IBM cards	$450	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,600	57.14	60.00	36.32
[illegible]aprofes[illegible]al Salaries	$ 800	12.70	13.33	8.07
General Equipment	none	--	--	--
Special Equipment	$5,062	80.35	84.37	51.07
Materials	$ 450	7.14	7.50	4.54
Total Cost	$9,912	157.33	165.20	

TABLE B-28

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Mathematics 30 and 31
Time Period: 18 weeks
Actual Enrollment: 150
Optimum Enrollment: 150

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/15	$4,630
15/15	$5,670

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Student Assists. work between 7-15 hrs/week	$1,332

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	$1,000	150	4 sems.

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$1,350	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$10,300	68.67	68.67	85.71
Paraprofessional Salaries	$ 1,332	8.88	8.88	11.08
General Equipment	none	--	--	--
Special Equipment	$ 250	1.67		2.08
Materials	$ 135	.90	.90	1.12
Total Cost	$12,017	80.11	80.12	

TABLE B-29

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Mathematics 30 and 31
Time Period: 18 weeks
Actual Enrollment: 72
Optimum Enrollment: 67

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/16	$7,375
5/16	$8,065

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,903	54.21	58.25	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$3,903	54.21	58.25	

TABLE B-30

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Mathematics 117
Time Period: Three 6-week sessions
Actual Enrollment: 83
Optimum Enrollment: 360

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/14	$4,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$1,800	87	rental
Special	$ 545	83	rented

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$3,849	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$ 964	11.61	2.68	26.10
Paraprofessional Salaries	none	--	--	--
General Equipment	$1,800	21.69	5.00	48.73
Special Equipment	$ 545	6.57	1.51	14.75
Materials	$ 385	4.64	1.07	10.42
Total Cost	$3,694	44.51	10.26	

TABLE B-31

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Mathematics 117

Time Period: Two 6-week sessions

Actual Enrollment: 77

Optimum Enrollment: 70

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2/18	$6,200

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$ 10	Consumable

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$ 689	8.95	9.84	98.57
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 10	.13	.14	1.43
Total Cost	$ 699	9.08	9.99	

TABLE B-32

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Physical Science 121

Time Period: 12 weeks

Actual Enrollment: 48

Optimum Enrollment: 50

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4/12	$3,333

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10 hrs/week @$1.60/hr.	$192

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$300	100	15 qtrs.
Special	$150	48	15 qtrs.

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,111	23.15	22.22	83.98
Paraprofessional Salaries	$ 192	4.00	3.84	14.51
General Equipment	$ 10	.21	.20	.76
Special Equipment	$ 10	.21	.20	.76
Materials	none	--	--	--
Total Cost	$1,323	27.56	26.46	

TABLE B-33

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Physical Science 121
Time Period: 12 weeks
Actual Enrollment: 20
Optimum Enrollment: 22

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4/12	$3,333

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$300	100	15 qtrs
Special	$150	20	15 qtrs

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,111	55.55	50.50	98.76
Paraprofessional Salaries	none	--	--	--
General Equipment	$ 4	.20	.18	.36
Special Equipment	$ 10	.50	.45	89
Materials	none	--	--	--
Total Cost	$1,125	56.25	51.14	

TABLE B-34

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Physical Science I
Time Period: 15 weeks
Actual Enrollment: 70
Optimum Enrollment: 160

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2/15	$6,000
3/7	$1,200

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2 hrs/week	$163
1 hr/week @$1.65/hr	$ 25

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$65,000	650	30 sems.
Special	$ 500	70	10 sems.

Supplies and Other Materials

Item	Value	Depreciation
Course Preparation	$325	10 sems.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,314	18.77	8.21	72.32
Paraprofessional Salaries	$188	2.69	1.17	10.35
General Equipment	$ 233	3.33	1.46	12.82
Special Equipment	$ 50	.71	.31	2.75
Materials	$ 32	.46	.20	1.76
Total Cost	$1,817	25.96	11.36	

TABLE B-35

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Physical Science 1

Time Period: 15 weeks

Actual Enrollment: 15

Optimum Enrollment: Not indicated

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$6,000
1/15	$7,000

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2 hrs/week	$163
1 hr/week @$1.65/hr	$ 25

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$65,000	650	30 sems
Special	$ 500	70	10 sems

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,667	111.13	N. A.	77.97
Paraprofessional Salaries	$ 188	12.53	N. A.	8.79
General Equipment	$233	15.53	N. A.	10.90
Special Equipment	$ 50	3.33	N. A.	2.34
Materials	none	--	--	--
Total Cost	$2,138	142.53	N. A.	

TABLE B-36

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Political Science 101
Time Period: 18 weeks
Actual Enrollment: 34
Optimum Enrollment: 35

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
21.4% instruc. 78.6% media coord.	$9,250

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
software	$237	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,979	58.21	56.54	98.8
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 24	.71	.69	01.2
Total Cost	$2,003	58.91	57.23	

TABLE B-37

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Social Science 101

Time Period: 18 weeks

Actual Enrollment: 33

Optimum Enrollment: 35

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
21.4% instruction 78.6% media coord.	$9,250

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
software	$185	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,979	59.97	56.54	99.1
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 18	.55	.51	0.9
Total Cost	$1,997	60.52	57.06	

TABLE B-38

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Psychology 1

Time Period: 19 weeks

Actual Enrollment: 33

Optimum Enrollment: 30

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$8,160

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Student tutors employed 5-9/wk.	$498

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
programed books	$640	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,632	49.45	54.40	58.92
Paraprofessional Salaries	$ 498	15.09	16.60	17.98
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 640	19.39	21.33	23.10
Total Cost	$2,770	83.94	92.33	

TABLE B-39

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Psychology 1
Time Period: 19 weeks
Actual Enrollment: 102 (3 sections)
Optimum Enrollment: 135 (3 sections)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
9/15	$8,160

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,896	48.00	36.27	100.00
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$4,896	48.00	36.27	

TABLE B-40

DIRECT COSTS OF INSTRUCTION FOR THE INDIVIDUALIZED PROGRAMED MODE

Course Title: Psychology 101
Time Period: 16 weeks
Actual Enrollment: 190
Optimum Enrollment: 200

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/15	$6,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15 hrs/week @$1.60/hr.	$ 384

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$300	1,400	10 sems.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc.	$ 50.00	consumable
tapes	$ 150.00	10 semesters
course preparation	$1,300.00	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$5,200	27.37	26.00	90.07
Paraprofessional Salaries	$ 384	2.02	1.92	6.65
General Equipment	$ 4	.02	.02	.07
Special Equipment	none	--	--	--
Materials	$ 185	.97	.92	3.20
Total Cost	$5,773	30.38	28.86	

TABLE B-41

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Psychology 101
Time Period: 16 weeks
Actual Enrollment: 637
Optimum Enrollment: 720

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
9/13	$2,527
3/18	$4,945
12/18	$4,135

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10 hrs/week @$1.60/hr.	$256
15 hrs/wee @1.60/hr	$384

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. sup.	$250	consumable

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

continued on next page . . .

TABLE B-41--continued

DIRECT COSTS OF INSTRUCTION FOR
THE CONVENTIONAL MODE

Course Title: Psychology 101 - continued
Time Period: ____________
Actual Enrollment: ____________
Optimum Enrollment: ____________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
9/15	$5,792
9/13	$9,247
6/15	$5.673

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$17,477	27.44	24.27	95.15
Paraprofessional Salaries	$ 640	1.00	.89	3.48
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 250	.39	.35	1.35
Total Cost	$18,367	28.83	25.51	

APPENDIX C

THE AUDIOTUTORIAL MODE

TABLE C-1

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Intermediate Algebra

Time Period: 16 weeks

Actual Enrollment: 52

Optimum Enrollment: 70

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/16	$5,212

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2 hrs. /week @$1.60/hr	$51

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$655	616	20 sems
Special	$900	52	12 sems

Supplies and Other Materials

Item	Value	Depreciation
labor preparation	$90	10 semesters
audiotapes	$75	10 semesters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$ 977	18.79	13.96	87.00
Paraprofessional Salaries	$ 51	.98	.73	4.54
General Equipment	$ 3	.06	.04	.27
Special Equipment	$ 75	1.44	1.07	6.68
Materials	$ 17	.33	.24	1.51
Total Cost	$1,123	21.60	16.04	

TABLE C-2

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Intermediate Algebra

Time Period: 16 weeks

Actual Enrollment: 24

Optimum Enrollment: 30

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/16	$52,212

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2 hrs/week @$1.60/hr	$51

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$655	616	20 sems
Special	$ 50	24	20 sems

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$ 977	40.71	32.57	94.76
Paraprofessional Salaries	$ 51	2.12	1.70	4.95
General Equipment	$ 1	.04	.03	.10
Special Equipment	$ 2	.08	.07	.19
Materials	none	--	--	--
Total Cost	$1,031	42.96	34.37	

TABLE C-3

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Anatomy and Physiology

Time Period: 11 weeks

Actual Enrollment: 124

Optimum Enrollment: 187

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/19	$2,500
12/19	$3,885

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Full Time	$1,848

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$11,000	325	48 qtrs.
Special	$2,500	124	28 qtrs.

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$1,183	20 qtrs.
software materials	$1,500	20 qtrs.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,033	32.52	21.57	65.14
Paraprofessional Salaries	$1,848	14.90	9.88	29.85
General Equipment	$87	.70	.47	1.41
Special Equipment	$89	.72	.48	1.44
Materials	$134	1.08	.72	2.16
Total Cost	$6,191	49.93	33.11	

TABLE C-4

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Anatomy and Physiology

Time Period: 11 weeks

Actual Enrollment: 178

Optimum Enrollment: 187

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/19	$2,500
12/19	$3,000
12/19	$2,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$10,000	275	48 qtrs
Special	$ 500	178	28 qtrs

Supplies and Other Materials

Item	Value	Depreciation
software	$300	20 quarters

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$5,053	28.39	27.02	96.78
Paraprofessional Salaries	none	--	--	--
General Equipment	$ 135	.76	.72	2.59
Special Equipment	$ 18	.10	.10	.34
Materials	$ 15	.08	.08	.29
Total Cost	$5,221	29.33	27.92	

TABLE C-5

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Introduction to Anthropology

Time Period: 12 weeks

Actual Enrollment: 120

Optimum Enrollment: 400

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/12	$3,113

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	(none)	--	--
Special	$2,085		21 qtrs.

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$3,113	15 qtrs.
software materials	$ 234	15 qtrs.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,556	12.97	3.89	82.85
Paraprofessional Salaries	(none)	--	--	--
General Equipment	(none)	--	--	--
Special Equipment	$99	.82	.25	5.27
Materials	$223	1.86	.56	11.87
Total Cost	$1,878	15.65	4.69	

TABLE C-6

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Introduction to Anthropology

Time Period: 12 weeks

Actual Enrollment: 160

Optimum Enrollment: 140 (4 sections)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/12	$3,113

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
films	$1,200	15 qtrs.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,113	19.46	22.24	97.10
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 80	.50	.57	2.50
Total Cost	$3,206	20.04	22.90	

TABLE C-7

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title:	Biological Concepts 110
Time Period:	16 weeks
Actual Enrollment:	56
Optimum Enrollment:	250

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
7/15	$3,832

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
30 hrs./wk.	$2,500

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$1,500/ $1,500	500/96	14 sem./ 40 sem.
Special	$1,000	56	2 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$1,000	consumable
course preparation	$300	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$1,788	31.93	7.15	30.55
Paraprofessional Salaries	$2,500	44.64	10.00	42.72
General Equipment	$34	.61	.14	.58
Special Equipment	$500	8.93	2.00	8.54
Materials	$1,030	18.39	4.12	17.60
Total Cost	$5,852	$104.50	23.41	

TABLE C-8

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Biological Concepts 110
Time Period: 16 weeks
Actual Enrollment: 56
Optimum Enrollment: 56

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
8/15	$3,832

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$1,500	96	40 sems
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$1,000	consumable

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$2,044	36.50	36.50	66.80
Paraprofessional Salaries	none	--	--	--
General Equipment	$ 16	.29	.29	.52
Special Equipment	none	--	--	--
Materials	$1,000	17.86	17.86	32.68
Total Cost	$3,060	54.64	54.64	

TABLE C-9

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Biology I

Time Period: 18 weeks

Actual Enrollment: 140

Optimum Enrollment: 140

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10/16	$9,500
2/15	$8,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10 hrs./wk. @ 1.90 /hr.	$1,026

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	(none)	--	--
Special	$25,000	140	20 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$900	consumed
course preparation	$5,017	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$7,071	50.51	50.51	65.78
Paraprofessional Salaries	$1,026	7.33	7.33	9.55
General Equipment	(none)	--	--	--
Special Equipment	$1,250	8.93	8.93	11.63
Materials	$1,402	10.01	10.01	13.04
Total Cost	$10,749	76.78	76.78	

TABLE C-10

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Biology 1
Time Period: 18 weeks
Actual Enrollment: 330
Optimum Enrollment: 350

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10/15	$9,000
5/15	$4,500
5/15	$6,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
$600/month	$2,700
3 hrs/week @$1.90/hr	$ 103
7-1/2 hrs/wk @$1.90/hr	$ 256

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$10,000	560	20 sems.
Special	$ 9,120	330	20 sems.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$500	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials$				
Total Cost				

TABLE C-10--continued

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Biology 1 - continued

Time Period: ________

Actual Enrollment: ________

Optimum Enrollment: ________

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
5/15	$7,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$12,166	36.87	34.76	73.84
Paraprofessional Salaries	$3,059	9.27	8.74	18.57
General Equipment	$ 295	.89	.84	1.79
Special Equipment	$ 456	1.38	1.30	2.77
Materials	$ 500	1.52	1.43	3.03
Total Cost	$16,476	49.93	47.07	

TABLE C- 11

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Biology 1A

Time Period: 17 weeks

Actual Enrollment: 106

Optimum Enrollment: 180

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/15	$9,222
15/15	$8,183

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
20 hrs./wk. @ $3.50/hr.	$1,190
4 hrs./wk. @ $2.07/hr.	$ 141

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$24,000	206	40 sem.
Special	$ 7,570	106	20 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$2,000	2 sem.
software materials	$1,500	10 sem.
course preparation	$ 600	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$17,405	164.20	96.69	84.43
Paraprofessional Salaries	$1,331	12.56	7.39	6.46
General Equipment	$291	2.75	1.62	1.41
Special Equipment	$378	3.57	2.10	1.83
Materials	$ 410	3.87	2.28	2.07
Total Cost	$19,815	186.93	110.08	

TABLE C-12

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Biology 1A

Time Period: 18 weeks

Actual Enrollment: 55

Optimum Enrollment: 60

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/20	$9,222

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equip-ment	Depre-ciation
General	$22,000	150	20 sems
Special	$ 660	55	20 sems

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$2,600	2 sems.
software	$1,000	10 sems.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enroll-ment	Optimum Enroll-ment	
Professional Salaries	$6,916	125.75	115.27	79.02
Paraprofes-sional Salaries	none	--	--	--
General Equipment	$ 403	7.33	6.72	4.60
Special Equipment	$ 33	.60	.55	.38
Materials	$1,400	25.45	23.33	16.00
Total Cost	$8,752	159.13	145.87	

TABLE C-13

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Biology II

Time Period: 18 weeks

Actual Enrollment: 475

Optimum Enrollment: 600

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/15	$8,172
2/15	$7,734
7/15	$8,347

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Full Time	$3,500

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	$36,212		10 sem.

Supplies and Other Materials

Item	Value	Depreciation
course supplies	$9,821	3 sem.
IMC charges	$1,480	3 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries				
Paraprofessional Salaries				
General Equipment				
Special Equipment				
Materials				
Total Cost				

continued on next page . . .

TABLE C-13--continued

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Biology II (continued)
Time Period:
Actual Enrollment:
Optimum Enrollment:

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
1/15	$7,953
1/15	$5,806
5/15	$5,587

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General			
Special			

Supplies and Other Materials

Item	Value	Depreciation

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$15,878	33.43	26.46	59.32
Paraprofessional Salaries	$ 3,500	7.37	5.83	13.08
General Equipment	none	--	--	--
Special Equipment	$3,621	7.62	6.03	13.53
Materials	$3,767	7.93	6.28	14.07
Total Cost	$26,766	56.35	44.61	

TABLE C- 14

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Biology 112

Time Period: 15 weeks

Actual Enrollment: 45

Optimum Enrollment: 100

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
45/354	$5,250

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10/10	$720
5/40	$2,775

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$13,970/ 70,000	450/883	10 sem.
Special	(none)	--	--

Supplies and Other Materials

Item	Value	Depreciation
software including	$14,475	10 sem.
course preparation		

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$667	14.82	6.67	18.13
Paraprofessional Salaries	$1,067	23.71	10.67	29.01
General Equipment	$497	11.04	4.97	13.51
Special Equipment	(none)	--	--	--
Materials	$1,447	32.16	14.47	39.34
Total Cost	$3,678	81.73	36.78	

TABLE C- 15

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Biology 115

Time Period: 17 weeks

Actual Enrollment: 319

Optimum Enrollment: 400

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
18/18	$5,750

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
full-time	$3,600

Equipment

Type	Value	Number Utilizing Equip-ment	Depre-ciation
General	$64,080	655	24 sems
Special	$19,670	319	20 sems

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$ 500	none
course preparation	$2,400	10 sems.
duplicating	$ 800	none

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enroll-ment	Optimum Enroll-ment	
Professional Salaries	$5,750	18.03	14.37	43.65
Paraprofes-sional Salaries	$3,600	11.29	9.00	27.33
General Equipment	$1,300	4.08	3.25	9.87
Special Equipment	$ 983	3.08	2.46	7.46
Materials	$1,540	4.83	3.85	11.69
Total Cost	$13,173	41.29	32.93	

TABLE C-16

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Biology 115
Time Period: 17 weesk
Actual Enrollment: 131
Optimum Enrollment: 150

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
13/19	$6,750

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
no --	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$64,080	655	24 sems
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$500	none
field trips	$300	none
duplicating	$100	none

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,618	35.25	30.79	76.31
Paraprofessional Salaries	none	--	--	--
General Equipment	$ 534	4.08	3.56	8.82
Special Equipment	none	--	--	--
Materials	$ 900	6.87	6.00	14.87
Total Cost	$6,052	46.20	40.35	

TABLE C-17

DIRECT COSTS OF INSTRUCTION FOR
THE AUDIOTUTORIAL MODE

Course Title: Biology 115

Time Period: 17 weeks

Actual Enrollment: 477

Optimum Enrollment: 900

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15	$7,092
6/18	$6,181
18/18	$5,250

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15 hrs./wk. @ $1.60 /hr.	$720

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$60,000	602	40 sem.
Special	$29,999	477	16 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc.	$800	consumed
course preparation	$600	10 sem.
signs and charts	$800	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$8,729	18.30	9.70	44.30
Paraprofessional Salaries	$720	1.51	.80	3.65
General Equipment	$1,189	2.49	1.32	6.04
Special Equipment	$8,125	17.03	9.03	41.24
Materials	$940	1.97	1.04	4.77
Total Cost	$19,703	41.31	21.89	

TABLE C-18

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Biology 101

Time Period: 17 weeks

Actual Enrollment: 66

Optimum Enrollment: 150

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
12/18	$6,000
6 hrs/evening	$1,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10/40	$125

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$60,000	602	40 sems.
Special	$ 7,000	66	40 sems.

Supplies and Other Materials

Item	Value	Depreciation
misc.	$800	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$5,500	83.33	36.67	81.31
Paraprofessional Salaries	$ 125	1.89	.83	1.85
General Equipment	$ 164	2.48	1.09	2.43
Special Equipment	$ 175	2.65	1.17	2.59
Materials	$ 800	12.12	5.33	11.83
Total Cost	$6,764	104.48	45.09	

TABLE C-19

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Chemistry 51

Time Period: 18 weeks

Actual Enrollment: 38

Optimum Enrollment: 160

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4.33/15.33	$8,450

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
5 hrs./wk. @ $3.25/hr.	$292

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$14,736	32	10 sem.
Special	$3,104	38	10 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$75	consumed
course preparation	$100	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$2,388	62.84	14.92	55.33
Paraprofessional Salaries	$292	7.68	1.82	6.77
General Equipment	$1,241	32.66	7.76	28.75
Special Equipment	$310	8.16	1.94	7.18
Materials	$85	2.24	.53	1.97
Total Cost	$4,316	113.58	26.97	

TABLE C-20

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Chemistry 51

Time Period: 18 weeks

Actual Enrollment: 31

Optimum Enrollment: 92

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4.33/15.33	$8,450

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
1 hr/wk. @$3.25/hr.	$58

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$14,736	32	10 sems
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$ 75	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$2,388	77.03	25.96	60.49
Paraprofessional Salaries	$ 58	1.87	.63	1.47
General Equipment	$1,427	46.03	15.51	36.15
Special Equipment	none	--	--	--
Materials	$ 75	2.42	.82	1.90
Total Cost	$3,948	127.35	42.91	

TABLE C-21

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: General College Chemistry

Time Period: 16 weeks

Actual Enrollment: 214

Optimum Enrollment: 250

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
20/20	$7,500
20/20	$5,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
40 hrs./wk.	$1,024

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	(none)	--	--
Special	$10,000	214	20 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc.	$200	consumed
course preparation	$16,000	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$13,000	60.75	52.00	79.64
Paraprofessional Salaries	$1,024	4.79	4.10	6.27
General Equipment	(none)	--	--	--
Special Equipment	$500	2.34	2.00	3.06
Materials	$1,800	8.41	7.20	11.03
Total Cost	$16,324	76.28	65.30	

TABLE C-22

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: General College Chemistry
Time Period: 16 weeks
Actual Enrollment: 105
Optimum Enrollment: 120

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
18/18	$7,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
20 hrs/wk	$512

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	$1,000	105	20 sems

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$7,500	71.43	62.50	93.03
Paraprofessional Salaries	$ 512	4.88	4.27	6.35
General Equipment	none	--	--	--
Special Equipment	$ 50	.48	.42	.62
Materials	none	--	--	--
Total Cost	$ 8,062	76.78	67.18	

TABLE C-23

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Economics 102

Time Period: 15 weeks

Actual Enrollment: 68

Optimum Enrollment: 55

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
86.08%	$3,375

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$9,337	984	10 sem.
Special	(none)	--	--

Supplies and Other Materials

Item	Value	Depreciation
media	$1,801	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$2,905	42.72	52.82	92.22
Paraprofessional Salaries	(none)	--	--	--
General Equipment	$65	.96	1.18	2.06
Special Equipment	(none)	--	--	--
Materials	$180	2.65	3.27	5.71
Total Cost	$3,150	46.32	57.27	

TABLE C-24

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Electronics 230
Time Period: 15 weeks
Actual Enrollment: 9
Optimum Enrollment: 20

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
8.57%	$5,062
4.48%	$4,537

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$53,900	104	20 sem.
Special	(none)	--	--

Supplies and Other Materials

Item	Value	Depreciation
media	$314	10 sem.

	Total Cost	Cost Per Student: Actual Enrollment	Cost Per Student: Optimum Enrollment	Percentage of Total Cost
Professional Salaries	$637	70.78	31.85	70.70
Paraprofessional Salaries	(none)	--	--	--
General Equipment	$233	25.89	11.65	25.86
Special Equipment	(none)	--	--	--
Materials	$31	3.44	1.55	3.44
Total Cost	$901	100.11	45.05	

TABLE C-25

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: English A
Time Period: 9 weeks
Actual Enrollment: 608
Optimum Enrollment: 608

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/15	$4,064
3/15	$2,903
6/15	$4,393

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
Not identified	$2,646

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	(none)	--	--
Special	$50,000	608	20 qtrs.

Supplies and Other Materials

Item	Value	Depreciation
general supplies	$1,800	4 qtrs.
software materials	$10,450	20 qtrs.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,963	6.52	6.52	39.31
Paraprofessional Salaries	$2,646	4.35	4.35	26.25
General Equipment	(none)	--	--	--
Special Equipment	$2,500	4.11	4.11	24.80
Materials	$972	1.60	1.60	9.64
Total Cost	$10,081	16.58	16.58	

TABLE C-26

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: English B
Time Period: 9 weeks
Actual Enrollment: 23
Optimum Enrollment: 30

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
2/15	$4,064

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
full-time @$1.65/hr	$144

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$ 542	23.57	18.07	79.01
Paraprofessional Salaries	$ 144	6.26	4.80	20.99
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$ 685	29.83	22.87	

TABLE C-27

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Humanities I

Time Period: 18 weeks

Actual Enrollment: 211

Optimum Enrollment: 250

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/15	$7,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
10 hrs. /wk. @ $3.00 /hr.	$540
5 hrs. /wk. @ $1.75 /hr.	$157

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$17,500	600	34 sem.
Special	$1,600	211	15 sem.

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$2,567	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$7,500	35.55	30.00	85.79
Paraprofessional Salaries	$697	3.30	2.79	7.97
General Equipment	$181	.86	.72	2.07
Special Equipment	$107	.51	.43	1.22
Materials	$257	1.22	1.03	2.94
Total Cost	$8,742	41.43	34.97	

TABLE C-28

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Humanities 1
Time Period: 18 weeks
Actual Enrollment: 246 (5 sections)
Optimum Enrollment: 350 (5 sections)

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/15	$7,500

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equip-ment.	Depre-ciation
General	none	--	--
Special	$300	246	15 sems

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enroll-ment	Optimum Enroll-ment	
Professional Salaries	$7,500	30.49	21.43	99.73
Paraprofes-sional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	$ 20	.08	.06	.27
Materials	none	--	--	--
Total Cost	$7,520	30.57	21.49	

TABLE C-29

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Mathematics 115

Time Period: 16 weeks

Actual Enrollment: 75

Optimum Enrollment: 150

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
3/15.7	$6,760.50
3/15	$7,338.50
3/16	$5,539.50

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
40 hrs./wk. @ $1.60/hr.	$1,024

Equipment

Type	Value	Number Utilizing Equip-ment	Depre-ciation
General	(none)	--	--
Special	$4,234	75	10 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$20.00	consumable
course preparation	$460	10 sem.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enroll-ment	Optimum Enroll-ment	
Professional Salaries	$3,798	50.64	25.32	71.51
Paraprofes-sional Salaries	$1,024	13.65	6.83	19.28
General Equipment	(none)	--	--	--
Special Equipment	$423	5.64	2.82	7.96
Materials	$66	.88	.44	1.24
Total Cost	$5,311	70.81	35.41	

TABLE C-30

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Mathematics 115

Time Period: 16 weeks

Actual Enrollment: 141

Optimum Enrollment: 105

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
5/15.7	$6,760.50
5/15	$6,966.50
5/12.7	$7,973

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	none	--	--
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$20.00	none

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$7,611	53.98	72.49	99.74
Paraprofessional Salaries	none	--	--	--
General Equipment	none	--	--	--
Special Equipment	none	--	--	--
Materials	$ 20	.14	.19	.26
Total Cost	$7,621	54.12	72.68	

TABLE C- 31

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Nursing 111
Time Period: 15 weeks
Actual Enrollment: 202
Optimum Enrollment: 210

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
40 hrs/week	$42,637
40 hrs/week	$14,885

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$139,000	405	20 sems
Special	$ 100	202	10 sems.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$400	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$57,522	284.76	273.91	93.69
Paraprofessional Salaries	none	--	--	--
General Equipment	$3,426	17.16	16.51	5.65
Special Equipment	$ 10	.05	.05	.02
Materials	$400	1.98	1.90	.65
Total Cost	$61,399	303.96	292.38	

TABLE C-32

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Nursing 111

Time Period: 15 weeks

Actual Enrollment: 62

Optimum Enrollment: 60

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
40 hrs/week	$6,995
40 hrs/week	$6,995
40 hrs/week	$6,995

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$800	80	20 sems.
Special	$200	62	10 sem.

Supplies and Other Materials

Item	Value	Depreciation
misc. supplies	$30	consumed

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$20,985	338.47	349.75	99.62
Paraprofessional Salaries	none	--	--	--
General Equipment	$ 31	.50	.52	.15
Special Equipment	$ 20	.32	.33	.09
Materials	$ 30	.48	.50	.14
Total Cost	$21,066	339.77	351.10	

TABLE C-33

DIRECT COSTS OF INSTRUCTION FOR THE AUDIOTUTORIAL MODE

Course Title: Psychology 1A
Time Period: 11 weeks
Actual Enrollment: 300
Optimum Enrollment: 300

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
15/15	$4,610

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
--	--

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	(none)	--	--
Special	$9,200	300	30 qtrs.

Supplies and Other Materials

Item	Value	Depreciation
course preparation	$800	15 qtrs.

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$4,610	15.37	15.37	92.76
Paraprofessional Salaries	(none)	--	--	--
General Equipment	(none)	--	--	--
Special Equipment	$307	1.02	1.02	6.18
Materials	$53	.18	.18	1.07
Total Cost	$4,970	16.57	16.57	

TABLE C-34

DIRECT COSTS OF INSTRUCTION FOR THE CONVENTIONAL MODE

Course Title: Psychology 1A

Time Period: 11 weeks

Actual Enrollment: 194

Optimum Enrollment: 240

Professional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
6/8	$4,483

Paraprofessional Salaries

Proportion of Assignment to This Course	Salary (adjusted for time period)
4 hrs/week @$2.00/hr	$88

Equipment

Type	Value	Number Utilizing Equipment	Depreciation
General	$75	194	per qtr.
Special	none	--	--

Supplies and Other Materials

Item	Value	Depreciation
none	--	--

	Total Cost	Cost Per Student		Percentage of Total Cost
		Actual Enrollment	Optimum Enrollment	
Professional Salaries	$3,362	17.33	14.91	95.38
Paraprofessional Salaries	$ 88	.45	.37	2.50
General Equipment	$ 75	.39	.31	2.13
Special Equipment	none	--	--	--
Materials	none	--	--	--
Total Cost	$3,525	18.17	14.69	

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